

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
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DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

April 18 to	Seaplane Competition at Monaco
May 2	
April 21 ...	Lecture on "The Commercial Future of Airships," by Air-Commdr. Edward Maitland, C.M.G., D.S.O., A.F.C., at Royal Society of Arts, John Street, Adelphi, at 4.30 p.m.
April 21 to	Pacific Aeronautical Exhibition at San Francisco.
28	
May 1 ...	Opening date for Royal Aero Club £10,000 prize competition for flight to India and back.
May 20 to	Pan-American Aeronautic Congress at Atlantic City.
30	
May 22 and	Aviation Competition at Juvisy in connection with Fêtes de Paris
23	
May 23 to 30	Seaplane Contests at Barcelona.
June 1 ...	Air Ministry Competition (Small Type Aeroplanes), Martlesham Heath
June 22 ..	Wilbur Wright Memorial Lecture, H.R.H. Prince Albert presiding, at 8 p.m., at Central Hall, Westminster. Commander J. C. Hunsaker will read a paper on "Naval Architecture in Aeronautics."
July 9 to	S.B.A.C. International Aero Exhibition at Olympia
20	
July (mid.)	Seaplane Contests at Antwerp
July 24 ...	Aerial Derby.
Aug. 1 ...	Air Ministry Competition (Seaplanes), Felixstowe
Aug. (end of)	Schneider International Race, Venice.
Sept. 1 ...	Air Ministry Competition (Large Type Aeroplanes), Martlesham Heath
Sept. ...	International aviation week (with competitions) at Brescia, Italy
Sept. 27 to	Gordon-Bennett Aviation Cup, France
Oct. 3	

EDITORIAL COMMENT



IN the estimates for the Revenue Departments under the Post Office Votes there appears an item of £75,000—in one quarter the amount is given as £7,500—for the conveyance of mails by air. This reminds us of the historic remark of the Scotsman who regretfully said that he had not been in London for a hour when "bang went saxeence." It is very evident that the P.M.G. and his advisers are not likely to do much toward the support of civil aviation off their own bats, and it would seem as though they had determined to mark time until a general decision of the Cabinet pushes them up to the line. Whether that decision will be made we have no means of knowing, but surely if the Post Office officials were as progressive as they ought to be, and had assimilated the knowledge that only by well-judged State-support of the civilian side of aviation can we maintain the margin of air power essential to our national safety, they would have come forward with something a good deal more ambitious than is indicated by the item they have included in the estimates.

It is scarcely to be wondered at that some of those who are holding on in the industry often ask themselves if it is worth while, and whether they would not be employing their capital and their brains to better advantage than in an industry which, while it was almost the be all and end all of things in the

War, is now relegated to the rôle of Cinderella. After all sorts of promises have been held out that assistance would be forthcoming, and after Ministers have gravely told the country that air power is as necessary to existence as sea power, we are now faced with the spectacle of the one Department which could have extended the helping hand and really done it on a business basis for value received, allocating a sum for the carriage of mails which in the circumstances can only be described as beggarly to the last limit. If the Post Office cannot do better than this, then it is good-bye to all hopes of improved communications by air.

**The
Weir
Committee
and
Air Mails**

Fortunately, the last word in the matter of the carriage of mails by aircraft does not rest with the Post Office. If the statements in an article in *The Times* in regard to the report on the future of civil flying, which is on the point of issue by Lord Weir's Standing Advisory Committee on Civil Aviation, are correct, this report recommends a great extension in the number of aerial mail services. The Committee had before it two concrete suggestions for the assistance of civil aviation. The first was a modification of the system in operation in France, under which a definite subsidy is paid in respect of every machine flown for commercial purposes. The other took the form of a suggestion to help the movement by a definite scheme for the conveyance of mails. It is, states *The Times*, the last which the Committee favours, and it proposes that the Post Office in future should enter into definite contracts for the conveyance of mails by air routes, and that, in addition to the London-Paris service, air mails should also be operated to Brussels and Amsterdam, and that as soon as possible fresh aerial routes should be opened between London and important centres within the United Kingdom, such as Glasgow and Dublin. The Committee also favours very strongly that an air mail route should be opened to India, *via* Egypt. At the present moment there are difficulties in the way of the latter, the French Government insisting that mails should be carried only by French machines over its own territory. The question is now being discussed, and it is hoped that the difficulties will be overcome shortly, and a definite scheme is under consideration for an aerial route from London to Marseilles.

The Committee recommends that the Post Office should guarantee a minimum daily load of 400 lbs. for each mail route, and that tenders should be asked from aircraft firms or groups for the carrying on of the services. The price, in the view of the Committee, should be fixed through a conference between representatives of the Government and the companies concerned on a fair basis of remuneration, as the industry is not yet in a position to make competitive tenders.

All this, if as stated, is good so far as it goes, but we must not be too sanguine, especially when we remember that the Committee has made previous reports quite as strong as the present which have been pigeon-holed and ignored by the Government. There is, however, rather more hope in this case than there has been room for on these previous occasions, because of the fact that the Committee was called upon in a hurry to make a further report on the measures necessary to be taken to assist the develop-

ment of civilian aviation immediately after the statements made by Mr. Holt Thomas relative to the financial difficulties besetting the London-Paris air service. Obviously, the Government have begun to realise what those best able to know have been telling them ever since the Armistice—that if we are to keep the lead in the air so hardly won in the War something must be done immediately to prevent the complete disintegration of the technical side of the industry. We trust this report will not follow in the wake of the others, but that the Government will really make up their minds that something must be done, and that quickly.

**Aerial Post
Charges**

if and when the Post Office gets down to the practical application of the recommendations of the Committee it is very much to be hoped that it will revise some of the grotesque methods it has employed in the past, particularly in the matter of the London-Paris service.

The charge of 2s. 6d. per letter, over and above the ordinary Continental rate, is enough in itself to stop the business community making extended use of the service. It has been shown, notably by Mr. Holt Thomas, that the service could be carried on commercially at the ordinary postal rates if a guaranteed load were available and if all first-class mail matter were automatically carried by air.

Again, even after the London-Paris service had been started and the Post Office had arranged to send a certain amount of mail matter by aerial transport, it was a long time before it was generally known to the business public. Attention was drawn at the time in these columns to the complete lack of publicity which accompanied the inauguration of this service, which made it almost appear that the postal authorities had entered upon the business against their will and hoped it would die of inanition. We do not say that this desire was present in their minds, but the manner in which the existence of the new facilities was concealed rather than advertised would certainly have lent colour to the suspicion if it had been voiced.

That sort of thing will not do at all. When a private firm goes out on a new enterprise the first thing it does is to advertise the fact and to court all the publicity possible. The Government Department which is in business to produce a revenue and to make a profit for the taxpayer is, in a sense, just as much in trade as the private concern, and if it wants to succeed it must do exactly as a well-managed private trading corporation would do in the same circumstances. It might have been thought that this was a lesson that had been learnt during the War, but apparently it has already been lost to sight. We do think that if the Post Office really does intend, whether of its own volition or because of instructions from the Government, to assist in the development of aerial mail services it must make its appeal for public support just in the same way as a big transport firm would do.

For the Postmaster-General to announce in the House that it has been arranged to send letters by air to Paris or Amsterdam, and to think that this is sufficient to cause the public to fall over themselves in their hurry to send letters (at 2s. 6d. an ounce) that way, may be the Government idea of publicity, but it is not business.



RODERIC HILL

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CUMULUS CLOUD FORMING IN HOT WEATHER: A Vickers-Vimy commercial type aeroplane flying above the clouds. *From an original drawing by Roderic Hill*

The Gordon- Bennett Aviation Contest

The French have always been very thorough in their methods of developing new movements. In the early days of the motor-car the Government, with far-sighted vision, realised that there was more in the new locomotion than a mere means of amusement, and extended to it all the assistance possible. Races on the public roads were not only permitted but encouraged, so that not only were those concerned with the industry enabled to discover and eliminate the weaker points of design and construction, but the mass of the public was given an opportunity of seeing the new invention developed under its eyes the while prejudice was removed by the rapid growth of familiarity with the car. It is true that there was revulsion after the disasters of the Paris-Madrid race, but that was short lived, and Government and people very soon realised that the accidents which attended this unfortunate event were in no sense due to the vehicle, but were to be laid to the account of bad organisation of the race itself. The policy of encouragement was pursued, with the result that by the time prejudice and persecution had been lived down in England, our own industry had years of leeway to make up and started with a handicap which must, to those in the industry at the time, have seemed almost impossible to overtake.

So it has been in the case of aviation—or at least was until the War gave everyone a completely new outlook on flying and aircraft. In France the early experimenters were given every facility for carrying out trials. As soon as practical flying became an established fact, every encouragement was given, both by the Government and by highly placed individuals, for the organisation of competitive and sporting events. The French imagination realised that there is nothing which develops what may be called a competitive invention so rapidly as the introduction of the spirit of competition. And so it is today. This year the race for the Gordon-Bennett Aviation trophy has to be flown in France, and our friends on the other side of the Channel are going all out to make the event a success, and incidentally to show to the many hundreds of foreign visitors who will attend the race that there is nothing quite so good as French machines and French engines. They are out to make a real "aviation week" such as we were used to see before the War—and we certainly wish them every success in the venture.

Whether such an extended programme of aerial events, would suit the British temperament we rather doubt. Our own crowds soon become *blasé*, and will not stand a long programme of flying or of any other series of events, such as will send a French assembly into ecstasies, and we think the R.Ae.C. is quite right to have confined our own programme to single sporting events, mostly of a long-distance character. We might add that we could wish the Club and those

associated with it in the promotion of sporting fixtures could have seen their way to the promotion of more of such events, because of the excellent propaganda they carry with them. However, it is possible they have good reasons for limiting the programme, and we shall not presume to quarrel with it.

Lord Inverforth and the Disposal Board

Last Sunday's *Observer* contained an interesting interview with Lord Inverforth, who has been at the head of the Ministry of Munitions since the Armistice. Primarily, the interview is based on the recent sale to a business syndicate of the great motor dépôt at Slough, which is a deal we do not propose to discuss here. It is interesting, however, to follow Lord Inverforth through his statements regarding the methods by which he and his staff of the Disposal Board have succeeded in getting rid of most of the surplus stores and material accumulated during the War, and of the manner in which those methods have worked to the advantage of the taxpayer. It is almost startling to hear that no less than £330,000,000 have been realised by the sales of surplus stores and on trading account of wool, leather, flax, and other materials, including ferrous and non-ferrous metals. The position regarding the various parts of the world where disposable stores were held at the end of the War is that in Belgium everything has been sold. In France £50,000,000 worth has been sold, mostly to the French Government. Over £80,000,000 worth has been brought back to this country to supplement War Office reserves; £15,000,000 worth has been brought back and sold in this country, leaving about £30,000,000 worth still to be sold. In Italy disposal will be completed this month. In East Africa all sales have been completed. In Egypt the work of disposal has been delayed by the unsettled condition of the country, but sales are being made. In Mesopotamia sales are proceeding satisfactorily. The only theatre where disposal is not proceeding apace is in the Balkans, and for this Lord Inverforth accounts significantly by saying that "it is still to be seen whether the War Office may not require many of the stores formerly regarded as surplus."

In reply to the critics who have accused the Disposal Board of holding up sales of commodities urgently required by the nation, Lord Inverforth quotes figures totalling £126,000,000 representing the sales of such materials. It is all very convincing as it reads, and while we agree that the task of disposing of the war surplus is no light one, we still are of opinion that there is another side to the picture, and that the real truth of matters lies somewhere between Lord Inverforth's rosy description of the activities of the Board and the criticisms which have been levelled against it.

Regulations for Civil Flying in Switzerland

THE Air Ministry has issued the following Notice to Airmen (No. 38):—

"It is notified for information that the Swiss Government have formulated the following rules, to be observed by all aircraft navigating over Swiss territory.

"1. Aircraft are not allowed to fly at a lower height than 1,000 m. (3,281 feet) above the undermentioned towns:—

"Basle, Berne, Bienne, Geneva, Lausanne, Lucerne, St. Gall, Winterthur, Zurich.

"2. Aircraft are not to fly at a lower height than 500 m. (1,640 ft.) over all other localities.

"3. For the present, landing is only permitted in Switzerland at places where the Customs Authorities have a control station in operation. These places are:—

"(a) For aeroplanes and airships.—Dubendorf, about five miles E. by N. of Zurich and La Blecherette, north of Lausanne.

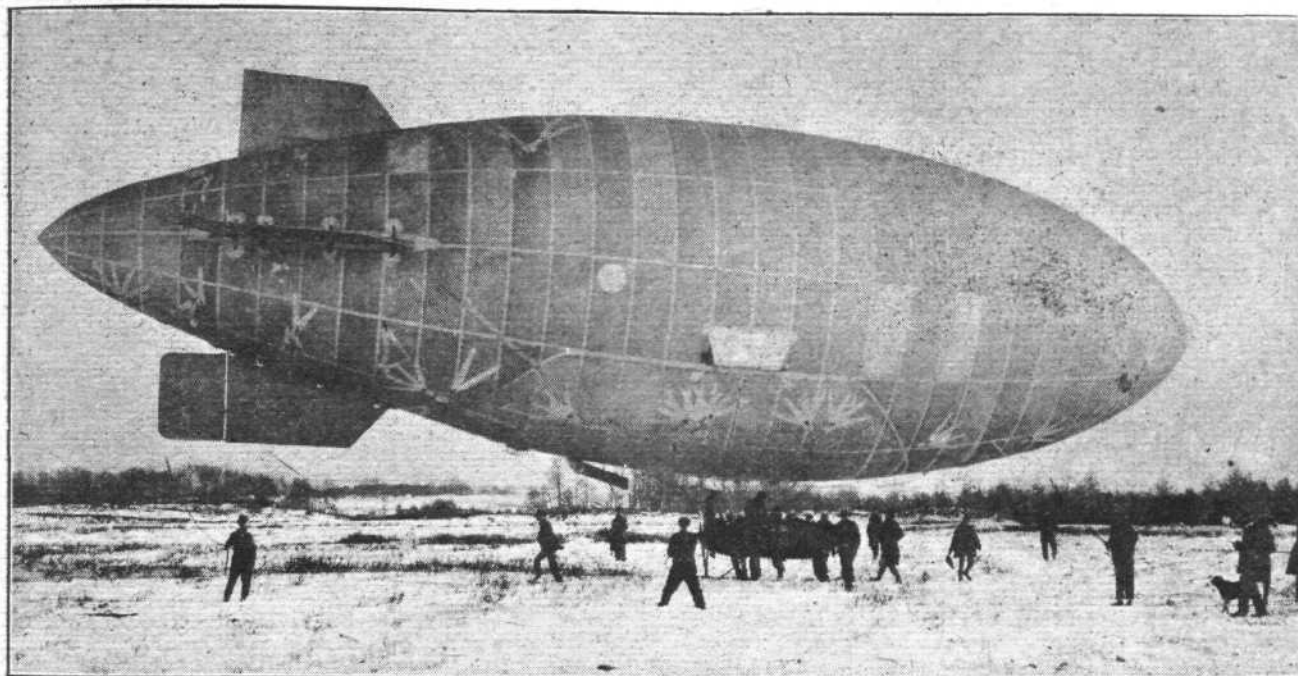
"(b) For seaplanes and flying-boats.—Geneva, Lugano, Ouchy, Romanshorn, Zurich, Zurichhorn.

"4. Arrangements are being made for the preparation of several other public landing grounds, where Swiss and foreign aircraft will be able to land after passing through the necessary customs formalities at one of the customs control stations mentioned above."

A SPORTING DIRIGIBLE

INASMUCH as free ballooning has proved to be a sport of considerable popularity in the past, there is no reason why "dirigible ballooning," by aid of the small power-driven dirigible, should not be equally—if not more, popular in the future. It is true that the cost of this newer form of sport is going to be somewhat higher, but then to balance this is the added advantage of being able to choose any desired

40 h.p. water-cooled engine driving a pusher screw. The overall length of the envelope is only 95 ft., and the capacity is 35,000 cub. ft. (7,000 cub. ft. ballonet). The useful lift as measured on trials, was 935 lbs., including passengers, ballast, anchor, drag rope, parachutes and fuel. (Barometer, 28.7 in., temperature—3 deg. Cent., gas purity 98.5 per cent., envelope pressure, .1 in.).



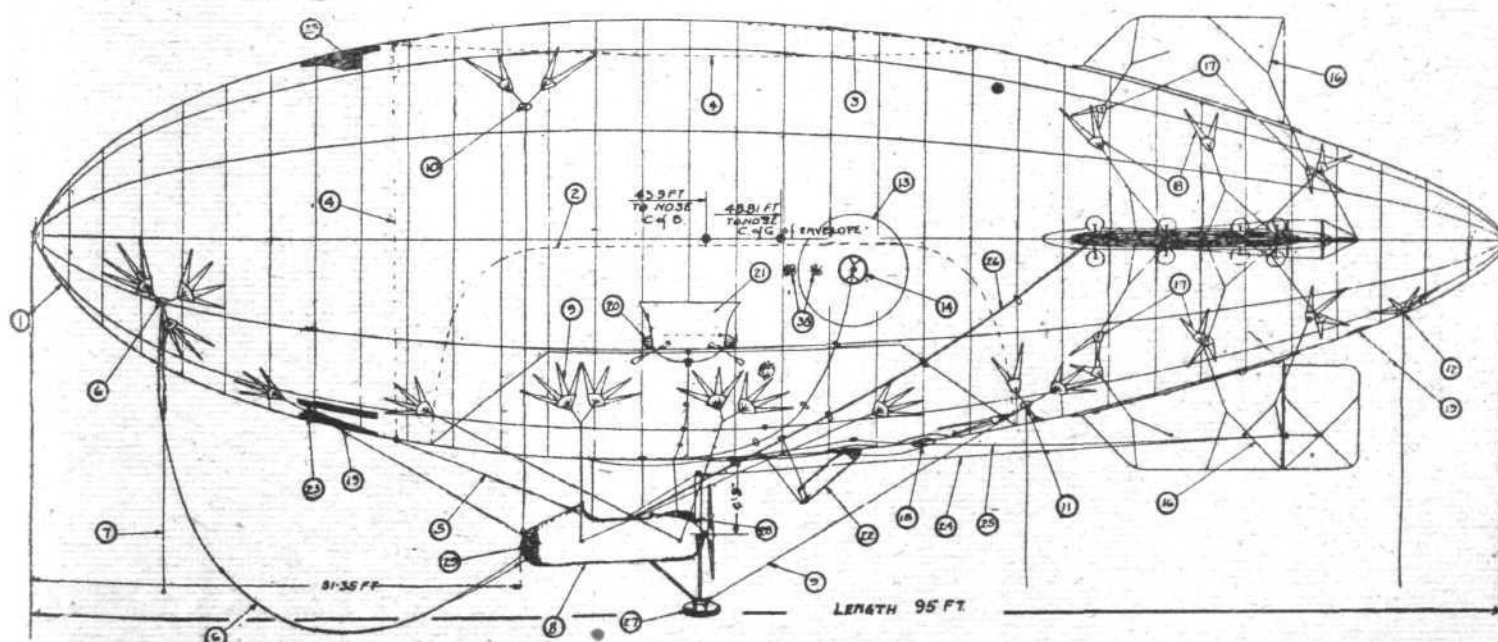
Side view of the Goodyear "Pony Blimp"

destination and get there in much less time than one would in a free balloon. During the War much has been learnt about the dirigible, and we have no doubts as to the practical possibilities of the "dirigible balloon." Already successful trials have been made in America by the Goodyear Company with what is, we believe, the smallest airship in the world. A brief description, with illustrations, of this "Pony Blimp," as it is called, appears in our American contemporary *Aviation*, and should be of interest to our readers.

The Goodyear "Pony Blimp" is non-rigid, with external rigging in the form of finger patches, which support a single streamlined car. Propulsion is effected by means of an Ace

Under assumed worst conditions at sea-level of 95 deg. Fahr. and 97 per cent. purity (or 85 deg. Fahr. and 95 per cent. purity) it would have a net lift of, approximately, 700 lbs. This would be enough for one man and full fuel (10 hours), or two men and half fuel, with still plenty of reserve for a light wireless set. A small overload, up to 50 lbs., can be carried dynamically without particular difficulty, providing it is in readily dispensable form. Besides the useful load proper as above listed, there is some 40 lbs. of water in the radiator, and about 20 lbs. of other material which could be used as ballast in an emergency.

In its trials the ship handled very easily and conveniently,



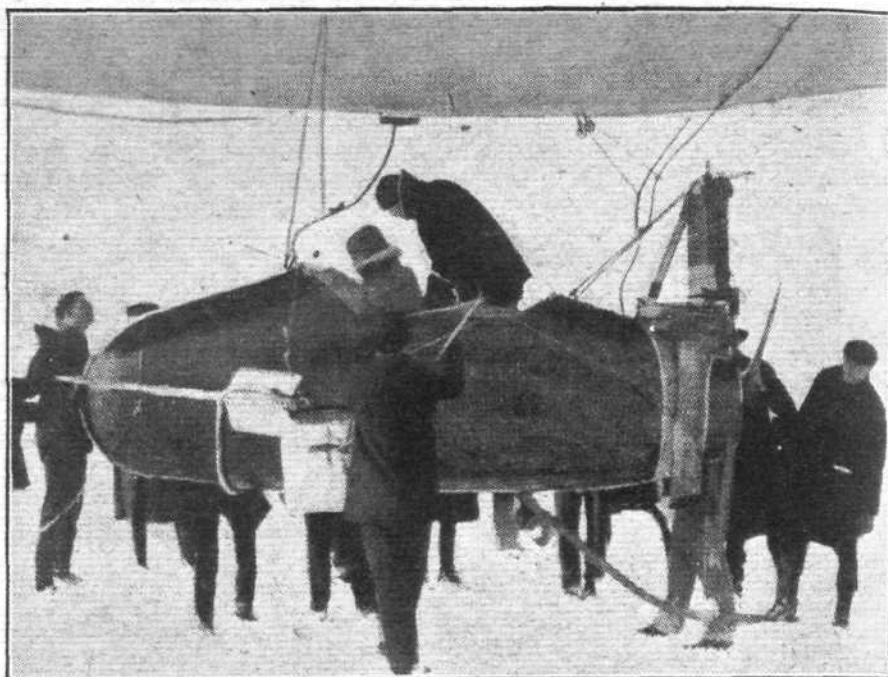
ELEVATION OF THE GOODYEAR "PONY BLIMP": 1. Envelope; 2. Ballonet; 3. Rip panel; 4-5. Rip panel cord; 6. Nose mooring line; 7. Nose grip lines; 8. Car; 9. Car suspension; 10. Side grab line; 11. Centre grab line; 12. Rear grab line; 13-14. Gas valve; 15. Air valve; 16. Fin brace wires; 17-18. Fin brace patches; 19. Inflation sleeve and cover; 20. Petrol tank; 21. Petrol tank sling; 22. Air scoop; 23. Licence number; 24. Rudder control line; 25. Rudder emergency line; 26. Elevator control line; 27. Landing bumper; 28. Motor; 29. Drag rope

there being no appreciable troubles developed. The quick manœuvring qualities were particularly noticeable, it being possible to make sharp turns. An angle of ascent of 42 deg. was obtained, and an angle of descent of 35 deg. Landing the ship was exceptionally easy, it being handled on one occasion, in a light breeze, by a crew of only two men.

The speed actually covered over a measured course in two directions averaged $37\frac{1}{2}$ m.p.h. in a light but gusty wind. Estimating from the pressure at which the nose caved in, the air-speed indicated slightly over 40 m.p.h. This was with full flight equipment, including parachutes. The propeller actually used was designed to obtain maximum speed. It will be possible, however, to get somewhat better efficiency and fuel economy with very little sacrifice in speed by using a larger propeller at slower r.p.m.

The 40 h.p. Ace engine—modified for airship use—consumed, approximately, 24 lbs. (nearly 4 gal.) of fuel per hour when running full out (2,000 r.p.m.). It throttles down nicely and runs with very little vibration. The radiator was found to be of ample size, indicating that it would cool the engine satisfactorily, even in the hottest weather. The mounting of the radiator, at the extreme rear adjacent to the propeller, gives sufficient suction to cool the engine, even in a static test. No trouble with starting has been experienced at any time.

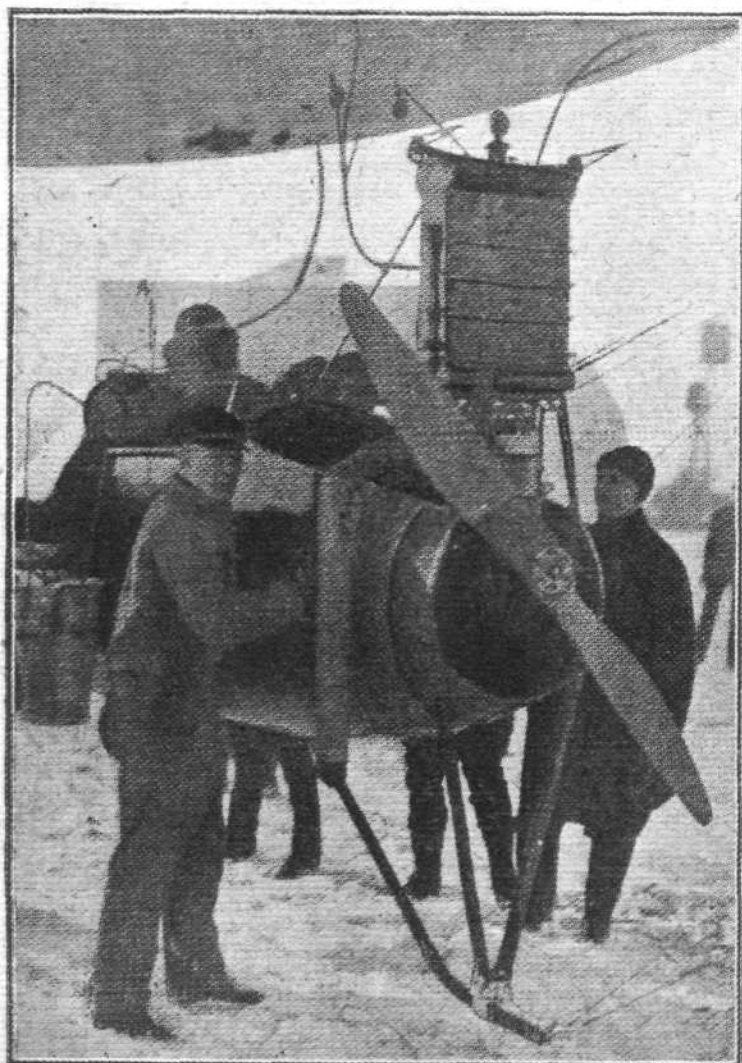
The two fuel tanks on each side of the envelope hold a total of 40 galls. There is a large release valve on one side only, which will, in a few seconds, discharge any or all of the petrol in that tank. After a few minutes have elapsed enough gasoline will flow through from the other tank to serve again as ballast. In this way half of the total amount of fuel on hand can always be quickly discharged, if necessary. The



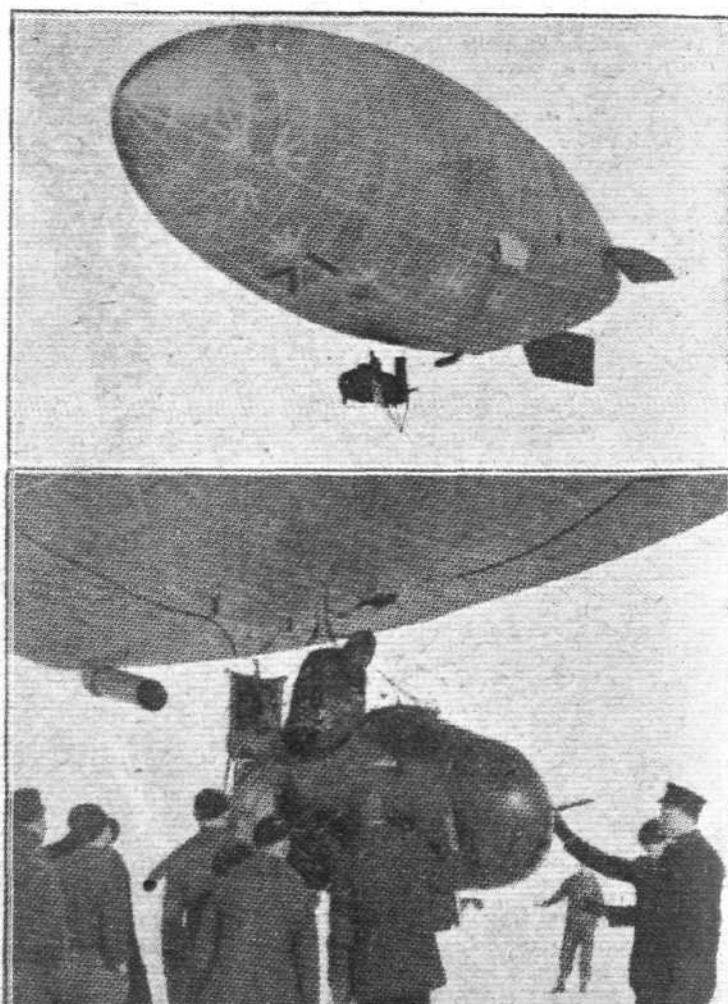
Side view of the car of the Goodyear "Pony Blimp"

tanks are filled by a simple connection in the car, without any necessity for climbing up to them.

The ship can be used as a kite balloon by allowing it to ride on the end of the drag rope. Again, the comparatively fat shape for the envelope, though somewhat less efficient than the shapes that have been used for larger ships, was selected mainly on account of its free-ballooning qualities, as well as for general compactness, simplicity and weight-saving. This combination of free- and dirigible-ballooning



The power-plant of the Goodyear "Pony Blimp"



The Goodyear "Pony Blimp" in flight, and, below, a forward view of the car

is, perhaps, the most important feature of all, with great possibilities. There is no claim that this little ship can be landed entirely without damage like a free balloon, as there is always likelihood of small breakages in the fins and the car, but there is every reason to believe that these would be less than with any ordinary size airship.

The car is of wood veneer construction, light but substantial, holding normally two persons, but wide enough to accommodate a third in the rear seat. There is plenty of space for wireless and other small apparatus, and the drag rope is carried in a box in the nose. A small pontoon bumper,

which fits the single skid, may be carried, if landing on water is desired. The lower fin, scoop, air valve, and car can all be removed when it is required to bag the ship down in the open.

A small-size harpoon anchor has been developed for this ship on the same principle as has been successful in larger ships. A new design of fuel pump is used for pumping petrol from the car to the tanks, which can also be used for pumping fuel up a hose when towing. For oversea use, a sea anchor is recommended, consisting of one flexible unit of the standard Goodyear design.

HONOURS FOR WAR SERVICE

By the unfortunate lifting of a dividing line in the list of appointments to the Order of the British Empire published in our last issue, a number of those who have been appointed Commanders were, by this omission, "temporarily" created Knights-Commanders. The omission of the heading was, however obvious, from the recommencement of the alphabetical order in which the names under each section were placed. The missing heading was as follows, and for the sake of accuracy we repeat that section of the list which should have appeared under it:—

To be Commanders of the Civil Division of the said Most Excellent Order.
Maj. EDWARD HALE TINDAL ATKINSON, R.A.F.—Services in connection with the International Air Convention.

NEVILLE GWYN GWYNNE, Esq.—Chairman, Engine Section, Society of British Aircraft Constructors.

WILLIAM THOMAS HANMAN, Esq., O.B.E.—Director of Inland Construction, Department of Works and Buildings, Air Ministry.

GEORGE D'OYLY HUTCHINS, Esq.—Late Chief Council Officer, Ministry of Munitions; Personal Assistant to Director-General, Aircraft Production Department.

ARTHUR JOHN McCORMACK, Esq., O.B.E.—Managing Director, Wolseley Motors, Ltd.

CHARLES LE MAISTRE, Esq.—Adviser to Aircraft Production Department, Ministry of Munitions.

THOMAS CHARLES WILLIS PUELLINGER, Esq., O.B.E.—Managing Director, Messrs. Aitrol-Johnston, Ltd.

THOMAS ERNEST STANTON, Esq., D.Sc., F.R.S.—Superintendent, Aerodynamical Department, National Physical Laboratory.

GEORGE ALEXANDER SUTHERLAND, Esq., M.D., F.R.C.P.—Valuable services to the Air Ministry.

HAROLD WARING, Esq.—Manager, The Alliance Aeroplane Co., Ltd.

COLIN MARTIN WILLIAMSON, Esq.—Valuable services to the R.A.F. in connection with photography.

REGINALD PAGE CAMPBELL WILSON, Esq.—Assistant Controller, Seaplane Supply, Aircraft Production Department, Ministry of Munitions.

In searching through the stupendous list of more than 5,600 appointments to the Order of the British Empire, some names of those who have been honoured for their work in connection with aviation were overlooked. We therefore give below a further list of appointments which should be added to those published in our last issue:—

To be Knight Commander of the Civil Division of the said Most Excellent Order.

THOMAS DRYSDALE NICOL, Esq.—Controller and Financial Adviser, Aircraft Contracts, Ministry of Munitions; services in connection with Disposals Board.

Air Routes in India.

THE work of surveying the main air routes in India is being carried out by R.A.F. officers, Flying Officer H. A. L. Pattison taking the route from Delhi to Calcutta, Flying Officer R. D. L. Stedman from Calcutta to Rangoon, Flying Officer Keward from Calcutta to Bombay, Flying Officer E. King from Bombay to Karachi, Observer Officer G. S. L. Hayward Delhi to Karachi. Capt. Gunning, Chief Inspector to the Indian Air Board, is now in Rangoon to advise the local Government as to the Burma terminal aerodrome. Some difficulty is likely to be experienced in connection with the two main terminals at Calcutta and Bombay. At Calcutta there is the maidan at Dum Dum, but the ground now being used at Bombay would be under water and impracticable in the monsoons. The Budget for 1920-21 provides five lakhs for civil aviation in India.

The Crew of the R 38

THE party of 55 American Air Force officers and men, under Commander Louis Maxfield and Lieut. Pennoyer, who are to take charge of R 38, are to be trained at Howden. The airship, which has been sold to the United States Government is being built at Bedford, but will not be ready before September. Briefly the dimensions of the R 38 are:—Length 694 ft. 5 in., diameter 85 ft., height 92 ft., gas capacity 2,724,000 cubic ft., nominal lift 82.7 tons, nominal horsepower 2,400, number of engines six, speed, maximum, 71, nominal, 67; cruising 45 m.p.h. Full speed range 5,190 miles, cruising speed range 9,400 miles. Endurance, full speed 77.5 hours, cruising 209 hours.

To be Officers of the Civil Division of the said Most Excellent Order.
ARTHUR BERRY, Esq.—Voluntary Research Worker, Royal Aircraft Establishment, Farnborough.

GEORGE DARNELL, Esq.—On Designing Staff, Messrs. Vickers, Ltd.

GEORGE HARRIS HANDASYDE, Esq.—Managing Director, Messrs. Martin-syde, Ltd.

ALFRED HOOPER, Esq., M.D.—Civilian Medical Officer at Aircraft Acceptance Park, Coventry.

To be Members of the Civil Division of the said Most Excellent Order.
EDWIN BACKHOUSE, Esq.—Staff Clerk, Secretary's Department, Air Ministry.

WILLIAM MARROW BECKETT, Esq.—Assistant to Chief Water Engineer, Department of Works and Buildings, Air Ministry.

BERYL ANGELICA SELBY, Mrs. BRADFORD.—Controller of Women Staff, Air Ministry.

DOUGLAS BROWNE, Esq., R.A.F.—Officers Pay Department, Messrs. Cox and Co.

MISS DAISY MAY BULLEN.—Hon. Secretary, A.I.D. War Savings Association.

PHILIP COHEN, Esq.—Staff Clerk, Secretary's Department, Air Ministry.

CHARLES RICHARD FAIREY, Esq.—Director, Fairey Aviation Co., Ltd.

LIEUT. HENRY LEONARD HALL, R.A.F.—Assistant General Manager, Nieuport and General Aircraft Co., Ltd.

DAISY, Mrs. HOARE.—Woman Staff Officer, Supply Department, Aircraft Production Department, Ministry of Munitions.

MISS EMILIE HOFFMAN.—Manageress, Air Ministry Refreshment Club.

MISS HELENE PENELOPE DORIS MITCHELL.—Sub-Section Director, Foreign Aircraft Services, Ministry of Munitions.

MISS LILIAN MARY HAMEL NASH.—Superintendent of Girl Messengers, Air Ministry.

STEPHEN PAYNE, Esq.—Chief Admiralty Airship Overseer at Messrs. Short's, Bedford.

CYRIL OLIVER ROSE PRICE, Esq.—R.A.F. Agency Department, Messrs. Cox and Co.

FREDERICK HENRY ROGERS, Esq.—Staff Clerk, Secretary's Department, Air Ministry.

HAROLD GREENWELL ROSE, Esq.—Chief Assistant to Drainage Engineer, Air Ministry.

FREDERICK SIGRIST, Esq.—Engineering Manager, Sopwith Aviation Co., Ltd.

HUGH HENRY BOYD STEWART, Esq.—Directorate of Inland Construction, Air Ministry.

ALICE ANNIE, Mrs. TEAGLE.—Y.M.C.A. Worker, Hendon Aircraft Canteen.

NELSON HILL TROTT, Esq.—Resident Engineer, Department of Works and Buildings, Air Ministry.

MISS ELMIRA MARGARET LOUISA WADE.—Administrative Assistant, National Aircraft Factories, Ministry of Munitions.

AMY GRACE, Mrs. WAINWRIGHT.—Y.M.C.A. Worker, Hendon Aircraft Canteen.

JOSEPH FRANCIS WELLS, Esq.—Staff Clerk, Marine Works Directorate, Air Ministry.

ROBERT OGILVY WESTON, Esq.—Directorate of Inland Construction, Air Ministry.

CAPTAIN MAURICE WINDSOR.—Chief Draughtsman, Aircraft Manufacturing Co., Ltd.

African Flyers Home.

CAPT. S. COCKERELL, Capt. F. C. Broome, D.F.C.; Sergt.-Major J. Wyatt, M.S.M., and Mr. S. Corby, the crew of the *Times* aeroplane which attempted to fly to the Cape, reached Southampton on the *Edinburgh Castle* on April 12.

Colonel van Ryneveld and Major Brand are coming home on the *Saxon*. Before leaving Capetown they received cordial messages of congratulation from the King, Mr. Churchill, Major-General Sykes, M. Bleriot, and the Air Council.

A Crash in Egypt

A MESSAGE from Cairo last week announced that a R.A.F. Handley Page had crashed at Abu Hamad on April 2. The four occupants, Flying Officer Jack John Barclay, M.C., Flying Officer Fidelity Desmond Wilkie, Sergt. E. W. Wadey, and Sec. Air Mech. R. C. Meldrum, were killed.

A R.A.F. Memorial at Lincoln

As a memorial to the 200 officers and men of the R.A.F. who were trained near Lincoln, and died in the service of their country, it is proposed to erect a stained-glass window in St. Mary's Church, Welton-by-Lincoln. It will be a three-light window, the centre panel occupied with a figure of St. George, with outstretched wings, piercing the head of the dragon of destruction with a lance; under the wings are clouds, landscape, and bay of the sea, over which are eight of the different types of aeroplane used near Lincoln. The tracery of the window will contain the R.F.C. and R.A.F. badges. Subscriptions may be sent to the Rev. A. Hunt (formerly R.A.F. Chaplain at Scampton and South Carlton), St. Mary's Vicarage, Welton-by-Lincoln.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

"Daily Express" £10,000 Prize

INTENDING competitors are reminded that the Competition for the *Daily Express* £10,000 Prize is open on May 1, 1920.

Entries must be sent in 14 days prior to any start being made.

RULES.

1. The proprietors of the *Daily Express* offer a Prize of £10,000 for the entrant who first succeeds under the subjoined conditions in carrying by air a cargo of 1,200 lbs. from Great Britain to India and back.

2. The Competition is open to persons of any nationality holding a licence issued by any Aero Club affiliated with the Fédération Aéronautique Internationale.

3. The Competition shall be conducted by the Royal Aero Club under the Competition Rules of the Royal Aero Club and the Regulations of the Fédération Aéronautique Internationale.

4. The flight must be accomplished between May 1, 1920, and October 31, 1920, both days inclusive.

5. The time occupied on either the outward or homeward journey is not to exceed 288 hours, and the homeward journey must be commenced within 15 days of the arrival in India.

6. (a)—The cargo may be carried on one aircraft or may be distributed between not more than two aircraft.

(b) Aircraft may be changed *en route* provided that all aircraft used by any one entrant are identified with one firm of aircraft constructors.

(c) The entrant must declare what types of aircraft will be used by him, and the Royal Aero Club, whose decision shall be final, shall decide whether such aircraft are in conformity with clause (b) hereof.

(d) The term "Aircraft" for the purpose of this Competition includes Aeroplanes, Seaplanes and Airships.

7. (a)—The crew must not be changed during the Competition.

(b) More than one member of the crew may be a pilot and act as such if required.

(c) Names of the crew must be given to the Royal Aero Club not less than 14 days prior to the start.

8. The selection and provision of the cargo of 1,200 lbs. are left to the entrant. No alteration in the outward or homeward cargo is permitted *en route*.

9. The start from and arrival back in Great Britain must be at an Air Station licensed for foreign travel.

10. Karachi is the control and turning point in India.

11. On the outward journey the time will be taken from the moment of leaving the land or water at an Air Station in Great Britain licensed for foreign travel until the arrival on land or water at Karachi, India. On the homeward journey the time will be taken from the moment of leaving land or water at Karachi until the arrival on land or water in Great Britain at an Air Station licensed for foreign travel.

12. The start from Great Britain and from Karachi must be made under the supervision of Officials appointed by the Royal Aero Club.

13. Competitors must conform to the Convention relating to International Air Navigation.

14. The Entry Fee is £100. This fee, together with the Entry Form, must be received by the Royal Aero Club, 3, Clifford Street, London, W. 1, at least 14 days before the start.

General

1. A competitor, by entering, thereby agrees that he is bound by the Regulations herein contained or to be hereafter issued in connection with this competition.

2. The interpretation of these regulations or of any to be hereafter issued shall rest entirely with the Royal Aero Club.

3. The competitor shall be solely responsible to the officials for the due observance of these regulations, and shall be the person with whom the officials will deal in respect thereof, or of any other question arising out of this competition.

4. A competitor, by entering, waives any right of action against the Royal Aero Club or the Proprietors of the *Daily Express* for any damages sustained by him in consequence of any act or omission on the part of the officials of the Royal Aero Club or the Proprietors of the *Daily Express* or their representatives or servants or any fellow competitor.

5. The aircraft shall at all times be at the risk in all respects of the competitor, who shall be deemed by entry to agree to waive all claim for injury either to himself, or his passenger, or his aircraft, or his employees or workmen, and to assume all liability for damage to third parties or their property, and to indemnify the Royal Aero Club and the Proprietors of the *Daily Express* in respect thereof.

6. The Committee of the Royal Aero Club reserves to itself the right, with the consent of the Proprietors of the *Daily Express*, to add to, amend or omit any of these rules should it think fit.

Gordon Bennett Aviation Race, 1920

The Aero Club de France has arranged to hold the Gordon Bennett Aviation Race in the neighbourhood of Paris during the period September 27 to October 2, 1920.

Gordon Bennett Balloon Race, 1920

The Aero Club of America has arranged to hold the Gordon Bennett Balloon Race at Indianapolis on October 23, 1920.

Barcelona Hydro-Aeroplane Meeting

(Under the Regulations of the Fédération Aéronautique Internationale)

May 23-30, 1920

The Royal Aero Club of Catalonia is organising an International Hydro-aeroplane Meeting at Barcelona from May 23 to May 30, 1920.

There will be a speed contest, the "Barcelona Grand Prix," which will take place over the circuit Barcelona-Palma (Majorca)-Valencia-Barcelona (approximately 750 km.).

In addition to the Pilot and the petrol and oil necessary to cover the whole course, a passenger and a load of 300 kgs. must be carried.

Entries must be forwarded, with full particulars of machines, etc., to the Royal Aero Club of Catalonia, Plazza del Teatro 2, Barcelona, before May 15, 1920. The entry fee is 100 pesetas.

The following Prizes are offered:—

1st Prize ..	30,000 pesetas.
2nd Prize ..	10,000 pesetas.

An altitude contest will take place in the port of Barcelona on May 30, 1920, for which the following Prizes are offered:—

1st Prize ..	2,000 pesetas.
2nd Prize ..	1,000 pesetas.
3rd Prize ..	500 pesetas.

FLYING SERVICES FUND COMMITTEE

A Meeting of the Flying Services Fund Committee was held on Monday, April 12, 1920, when there were present:—Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the Chair, Lieut.-Col. Alan Dore, D.S.O., Mr. Chester Fox, Squad.-Leader T. O'B. Hubbard, M.C., R.A.F., and the Secretary.

Applications for Assistance.—Thirty-five applications for assistance were considered, and Grants and Allowances were voted amounting to £400 1s. 2d.

THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916)

Administered by the Royal Aero Club

For the benefit of *Officers, Non-Commissioned Officers and Men* of the ROYAL AIR FORCE who are incapacitated while on duty, and for the widows and dependants of those who are killed or die from injuries or illness contracted while on duty.

Subscriptions :		£	s.	d.
Total subscriptions received to April 6, 1920 ..	17,012	10	2	
Major P. Litherland Teed	10	0	0	
Lieut.-Col. W. Oswald Watt	5	5	0	
Total, April 13, 1920	17,027	15	2	

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary

RIGID AIRSHIP CONSTRUCTION:

A Suggestion

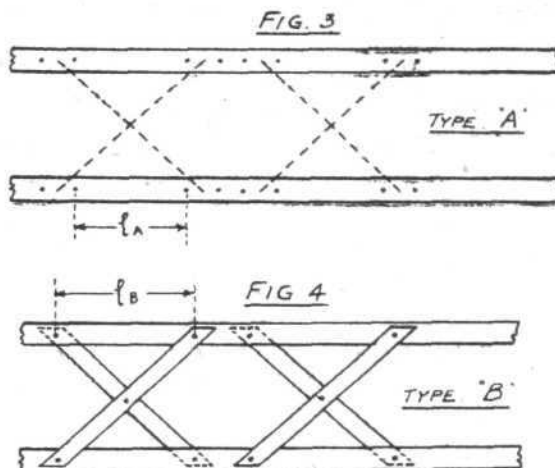
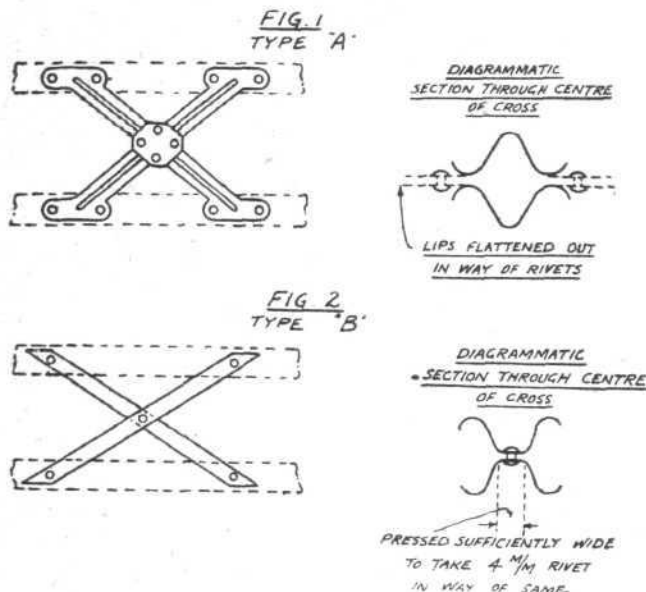
By A. E. RANKIN, A.Memb.Inst. Naval Architects.

Now that it is possible to once more turn our attention to airship construction for commercial work, one of the first problems needing careful consideration is that of cost of production. Our rigid airships of today involve a considerable sum to build, and therefore do not appear as a very tempting proposition in commercial circles. Financiers are not likely to indulge in airship ventures until this problem has been solved. At the present time, and likely for some years to come, demonstrated economy on the financial side will be a very prominent factor in enlisting support. The

the girder will fail at the weakest point, the member in compression will fail first as the nearest rivet will have an excess of strength over the compressive member by $700 - 330 = 370$ lbs. Therefore, a single-riveted connection is strong enough for the girder. The bearing surface of a 4 mm. rivet is sufficient for the connections in question.

Now let us compare the work involved in the two types of girders, assuming the length of girders to be 15 ft. 6 ins. long, approximately.

Type "A" will have 78 crosses, involving 936 rivets.



author, therefore, offers the following suggestion as one means of reducing the cost of construction.

To most readers of this article it will be well known that the hull of a rigid airship is composed of a series of braced girders. We know from the experience and investigation of several well-known authorities in recent years, on the strength of braced girders and columns, that we cannot depart generally from the fundamental rules governing the spacing of bracings. Let us, therefore, see what we can do in the actual manufacture of these girders.

It can easily be seen that the cost of braced girders varies as the number of bracings and the numbers of rivets in each bracing.

The present recognised type of bracing is shown in Fig. 1, in which it will be seen that one complete cross has 12 rivets. The lips of the members are flattened out at the centre and at the ends to receive the rivets. Let us call this Type "A."

Fig. 2 shows proposed type of bracing in which only five rivets are used. This we shall call Type "B."

Fig. 3 shows part girder Type "A."

Fig. 4 shows part girder Type "B."

On examining the two types of girder, it would appear that the double-riveted connections Type "A" afford more stiffness to the main channels than Type "B," and it has been the custom to look upon the elementary pin-jointed girders in Type "A" as fixed-end girders, and in Type "B" as free-end girders.

However, in practice, the disparity is not so great, and when we realise that the bracings on one side of a triangular girder overlap those on the adjacent side by one-third the pitch, the unsupported length "l" is very short, and consequently very stiff. Especially is this the case in double-braced girders, where the actual length "l" is very short indeed. If we take the unsupported length "l" in Type "A" and compare it with that in Type "B," we see that "B" requires to be a little stronger,

such that $1 + c \left(\frac{l}{K} \right)^2 : 1 + c \left(\frac{l}{K} \right)^2 = 1$. We should find that the increased section would be approximate, as shown in Fig. 6, and the increase in weight, after deducting the saving in rivets, would be about one half of one per cent. of the total lift of the ship.

The single shear of a 4 mm. rivet is 700 lbs., and a bracing of Type "B" would have a breaking strength of approximately 330 lbs. in compression and 2,000 lbs. in tension.

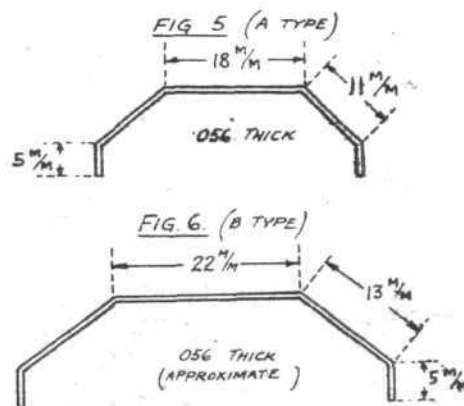
When the girder is under stress, one member of each pair of bracings will be in compression and the other in tension. As

Type "B" will have 78 crosses involving 390 rivets.

The huge saving in labour and cost is at once apparent, the saving on a finished girder being over 33 per cent. of the whole cost (labour only).

The estimated saving on a ship of present-day proportions is, approximately, £20,000, and the number of rivets saved would be about 700,000.

This enormous saving will have been obtained at the expense of approximately 0.5 per cent. of the total lift, which amount, I feel sure, could be considered insignificant in commercial aviation at least for the next few years; as it cannot be denied that, to foster a new industry, our greatest aims must be not only a reliable article, but quick production and cheapness also. If these aims can be obtained by such a small



sacrifice, then let us, by all means, make the sacrifice, until such times as this industry is well established.

One other feature I should like to mention before closing this article, and that is in respect to kingposts and trusses in main transverse framing. In view of the cost, it would, apparently, be more preferable to increase the size of section in main transverse girders than to introduce kingposts, especially if we realise that a complete kingpost and truss alone cost one and a half times the price of the plain main transverse girder. The total saving in cost for one ship would be, approximately, £3,000.

There is plenty of scope for the metallurgist to produce a cheaper alloy, and also for the fabric experts to introduce cheaper means of production.

It is to be hoped that others will come forward with suggestions for reducing the cost of rigid airship construction; and let us not be satisfied until we can produce a serviceable ship of present-day proportions for a very considerable amount less than the price which we saw published in various papers recently. Trade unionism and labour generally could do much in effecting this much reduced cost, by lending every assistance to

employers to obtain maximum output in minimum time. Great stimulus is needed at the present time if airship building is to continue and become popular.

It is therefore the duty of everyone engaged in this industry to give of his abilities to the fullest extent. If this is done, there is no reason why this country should not lead the way in one of the world's greatest new industries.

ROYAL AERONAUTICAL SOCIETY NOTICES



Election of Members.—The following members were elected in the various grades, as shown, at a Council Meeting held on March 16:—

Fellows.—G. Tilghman Richards.

Associate Fellows.—B. Campbell, C. I. R. Campbell, D. H. Kennedy, Miss R. D. Lang, J. S. Nicholson, W. E. Nuttall, M. H. Spencer, H. S. Wildeblood.

Members.—R. R. G. Adams, D. C. S.

Evill, H. S. Wicks, E. C. Vivian.

Associate Member.—F. W. Verry.

Students.—T. A. Kirkup, E. H. Mansbridge.

Transactions.—The second volume in the *Transactions of the Royal Aeronautical Society* is now available, and copies may be obtained at the Society's offices, price 5s. each. The paper is entitled "Position Fixing in Aircraft During Long Distance Flights over the Sea," the authors being Instructor-Comdr. T. Y. Baker, R.N., and Maj. L. N. G. Filon, Fellow.

Affiliated Societies.—An application for affiliation from the Cambridge University Aeronautical Society has been acceded to.

Lectures.—Maj. G. C. Tryon, M.P., late Under-Secretary of State for Air, will preside at Sir Sefton Brancker's lecture

on "Aerial Transport from the Business Point of View," on Wednesday evening, April 28.

Air League.—Pending confirmation at the next Council meeting, the Chairman, Air-Commodore R. K. Bagnall Wild, and the Vice-Chairman, Maj.-Gen. Sir R. M. Ruck, will represent the Society on the Committee of the Air League.

Donations.—The Council desire gratefully to acknowledge the gift of lantern slides of the R.A.F. engines from the Superintendent of the Royal Aircraft Establishment, Farnborough.

Meetings.—The next meeting of the Lectures and Publications Committee will be held in the Society's offices at 4 p.m. on Tuesday, April 20. A Council meeting will be held at 5 p.m. on the same day, when preliminary nominations of candidates for the office of Chairman for the year commencing in October will be received.

International Aero Show.—In response to a request from the Society of British Aircraft Constructors, the patronage of the Society has been accorded to the forthcoming International Aero Show at Olympia in July next. It is hoped to arrange for a room to be provided for the use of members during the Show.

W. LOCKWOOD MARSH,
Secretary.

7, Albemarle Street, W. 1.

The Gordon Bennett Aviation Cup

In connection with the competition for the Gordon Bennett Aviation Cup which is to be held at an aerodrome near Paris from Monday, September 27, to Saturday, October 2, the Aero Club of France is arranging a number of other events so that the meeting will be an "aviation week."

The Gordon-Bennett Balloon Race

For this year's competition for the Gordon-Bennett International Balloon Trophy, which is to be held at Indianapolis on October 22, France and Italy have entered teams of two each and England and Belgium one each. The United States have entered a full team of three.

U.S.A. Naval Developments

AMONG the plans of the aviation department of the United States Navy are one which calls for the building of two nine-engined triplane flying-boats—much larger than the N.C. class—and another for the construction of the biggest and fastest airship in the world. The latter is to be built in sections at Philadelphia, and erected in a hangar which is now being built at Lakehurst, L.I.

Service Aircraft in U.S.

THE Government Departments in the United States have agreed that aircraft provided by the Army and manned by Army personnel are to be designated "Army aircraft"; those provided by the Navy and manned by Navy personnel

are to be known as "Navy aircraft"; while those provided by the Navy and manned by Marine personnel will be called "Marine aircraft."

Science in the Air

PROFESSOR DAVID TODD, head of the Department of Astronomy at Amherst College, and Maj. Leo Stevens are making arrangements to carry out a series of balloon ascents in the States with the object of conducting astronomical, meteorological and pathological observations at 10,000 ft., 25,000 ft., 45,000 ft. and 50,000 ft. The balloon they will use will have a capacity of 140,000 cub. ft., and the car will be equipped with an elaborate installation of observing and recording instruments, as well as special apparatus, to enable the work to be carried out at high altitudes.

Helium Gas in the U.S.

A joint Army-Navy Board has been formed by the United States War and Navy Departments for the purpose of co-ordinating the various activities in connection with helium gas. The Board also includes a representative of the Bureau of Mines of the Department of the Interior.

A 500 Passenger 'Bus

In the course of a speech at a recent banquet at New York, Signor Caproni is stated to have announced that he had prepared the plans for a giant machine, of 12,000 h.p., capable of carrying 500 persons!



A group of members of the Cambridge University Aeronautical Society, secured on the occasion of their visit to the Royal Aircraft Establishment, Farnborough, recently.

THE JUNKER SINGLE-SEATER ALL-METAL MONOPLANE, TYPE D1

(Concluded from page 396.)

Tail Unit

THIS portion of the Junker D.1. is particularly interesting and incorporates several novel features. The corrugated, fuselage covering finishes in a vertical plane just in front of the tail planes, and a rear body portion is built up integrally with the fixed tail planes.

The construction of this tail portion follows the general

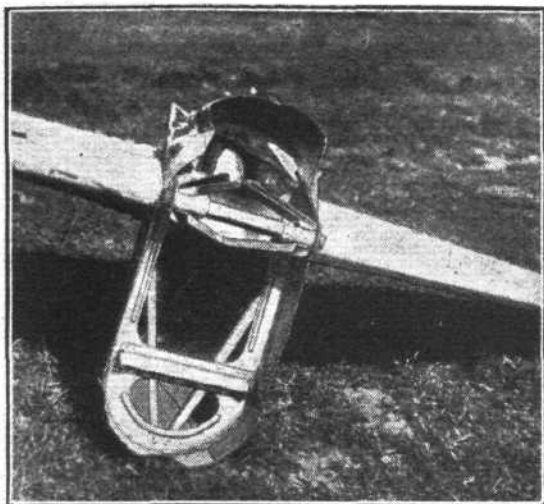


Fig. 15

lines laid down for the front part of the fuselage. Immediately behind the front edge a strong bulkhead is built up, and this frame carries the tail part of the attachments. This bulkhead, No. 8, is clearly shown in Fig. 15, which also shows a horizontal duralumin tube, supported a few inches in front of the bulkhead by means of four channel-section strips,

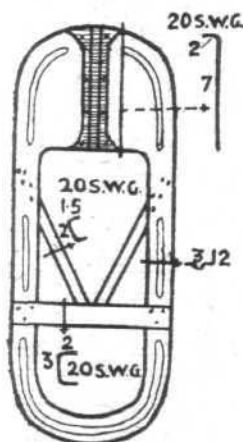


Fig. 16

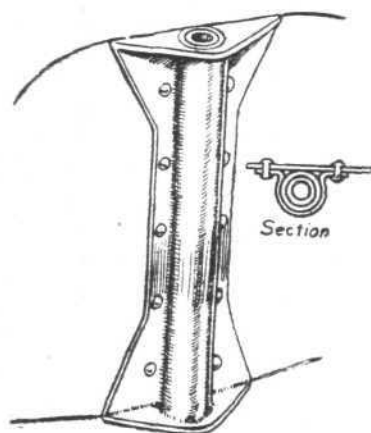


Fig. 17

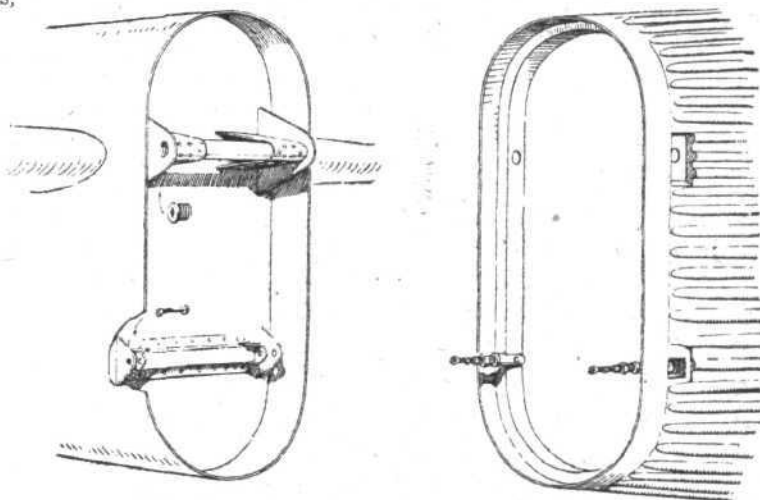


Fig. 18

which connect the extremities of the tubes to the bulkhead, two above and two below.

It should be borne in mind that this tube, though attached to the eighth former, becomes part of the seventh former when the tail portion is fitted to the body.

The ninth and last former is behind No. 8, and a diagram is shown in Fig. 16. It is to the upper portion of this former that the rudder post bearing is riveted. It consists of a bronze bush, about 17 cm. long, which is welded, by means of brazed-on steel collars, to a shaped piece of stout sheet steel, which is, in turn, riveted to the bulkhead. Fig. 17 shows this construction.

Junction of Body and Tail

Fig. 18, which is a diagram intended only to show the method of joining, shows the four-point attachment, but omits all details of bulkhead construction, etc.

The horizontal duralumin tube mentioned above, as being

fixed to the eighth bulkhead, carries threaded steel liners into which special hollow nuts screw. This arrangement provides what amounts to a pivot round which the tail portion can be swung (before, of course, the nuts are tightened up). The two lower attachments are really adjustable links—one is drawn half actual size in Fig. 19. It will be observed that, by means of a left-handed thread and a right-handed one, a considerable amount of variation is possible.

Since the tail planes are built into the tail portion, it is clear that the amount of this variation determines the angle of incidence of the tail planes. The shape of the rear portion gives an excellent streamline finish to the fuselage, and there is sufficient overlap between the coverings of body and tail-piece to ensure there being no gap at any reasonable setting of the rear portion.

The fixed tail planes have a strong riveted-on leading edge, to which the corrugated covering is attached.

Fig. 20, which serves to amplify this description, shows that the corrugations of the covering begin immediately behind the leading edge, which proves that this covering has been specially corrugated to suit its specific position, and is not just a piece cut from a larger corrugated sheet. A duralumin spar passes from side to side of the tail in the position shown by several of the photographs. It is a built-up spar, consisting of two channel section pieces, connected by two systems of Warren bracing, one on each side. At the rear of the tail planes is another channel spar, with its open side pointing rearward, and it is to this spar that the elevator is hinged, by means similar to those already described in connection with the aileron. The tail covering is connected to the fuselage covering by a separate right-angled strip riveted to both. The tail construction is further strengthened by two strips on each side of the body similar to those used for wing bracing. These are plainly visible in Fig. 20.

The single elevator is balanced, and is constructed very simply. There are no ribs or formers, but the covering is riveted directly to the hinge tube, which passes from end to end of the elevator. Narrow curved strips of duralumin are riveted above and below, and serve to bridge the gap between

elevator and tail planes. The D-shaped leading edge of the tail is carried on along the tips of the elevator, but the trailing edge is composed simply of the upper and lower coverings riveted together.

The tail skid is of ash, with the usual steel shoe. It is



Fig. 19

pivoted near its middle, the pivoting bolt being carried in a strong steel cradle, covered by an aluminium fairing. The shock-absorber is of triple-coil spring, and is attached to each side of the fuselage, as shown in Fig. 10.

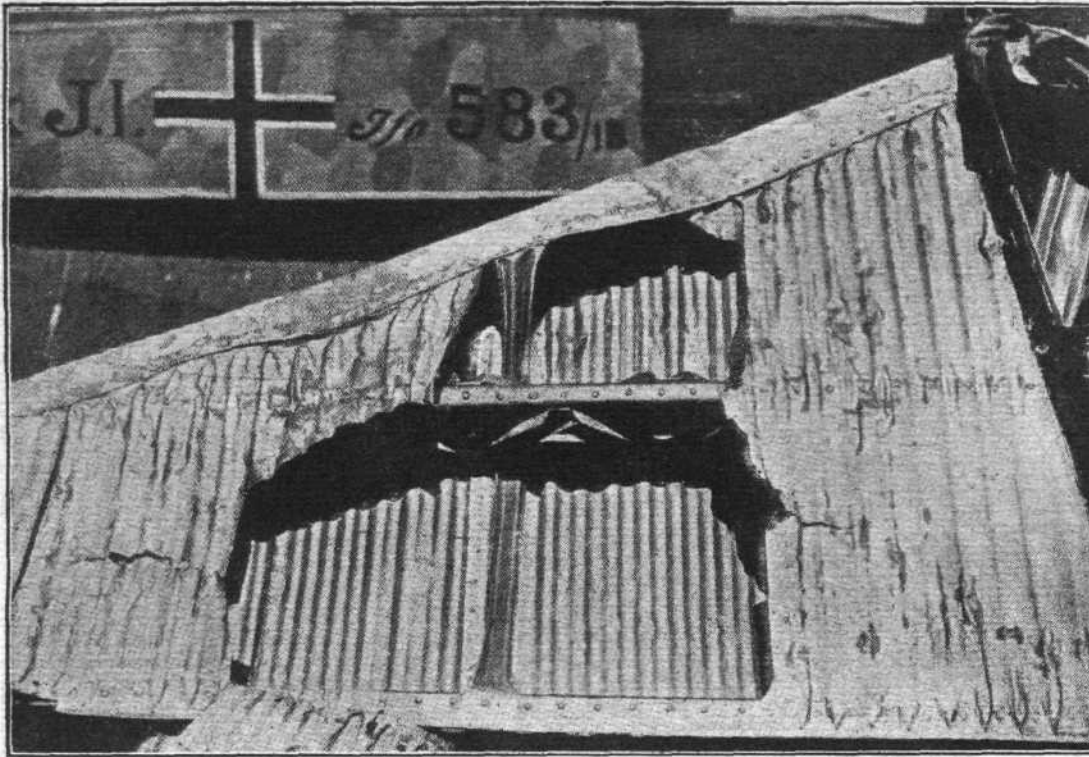


Fig. 20

Engine

The 180 h.p. Mercedes engine bears the number 36975, and was guaranteed till June 11, 1918. It is supported upon channel section bearers (4 cm. by 4 cm., open at top, 12 S.W.G.

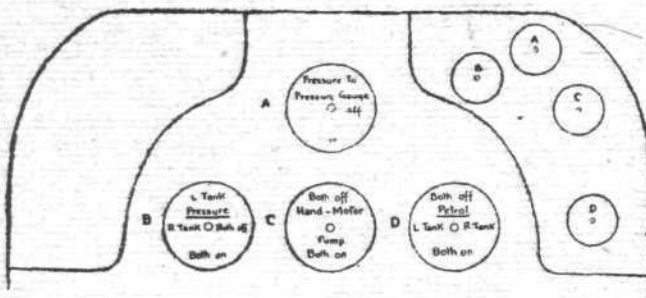


Fig. 21

duralumin), which are wood-filled from the front end to within 10 cm. of the rear. These bearers are carried on a triangulated system of duralumin tubes, flattened at the extremities and riveted to steel collars, as was described in the report on the Junker biplane. In this system the wing spars, which are

continuous throughout the centre section, play a leading part.

The propeller is an Axial, No. 18646, and bears this inscription :--

18646.
Axial.
Edul. Zug.
160 P.S. D.274 St. 215.
T.P. 90 G.

which gives the diameter as 2,740 mm., and the pitch as 2,150 mm.

It is built up of the usual laminations, and fixed to the crankshaft by the customary eight bolts.

Petrol System

It is probable that two separate petrol tanks were carried in the centre section, one on either side. They must have been accommodated in the triangular space between the bracing tubes. In Fig. 6 there may be seen a flat steel strip, bent round, with its two ends connected by a turnbuckle. This indicates that the tanks were probably cylindrical in form. The fact that the bracing tubes, which would be in contact with the tanks, are bound with coarse fabric tends to confirm the placing of the tanks.

Fig. 21 is a diagram of the dashboard of the Junker, with

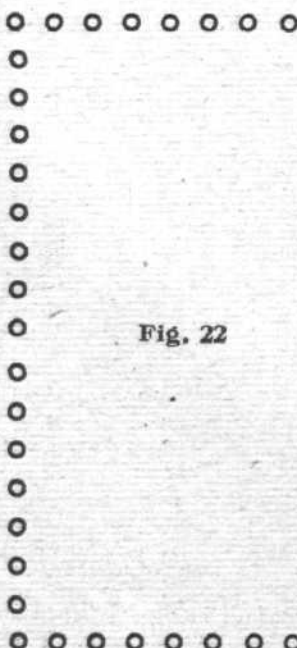
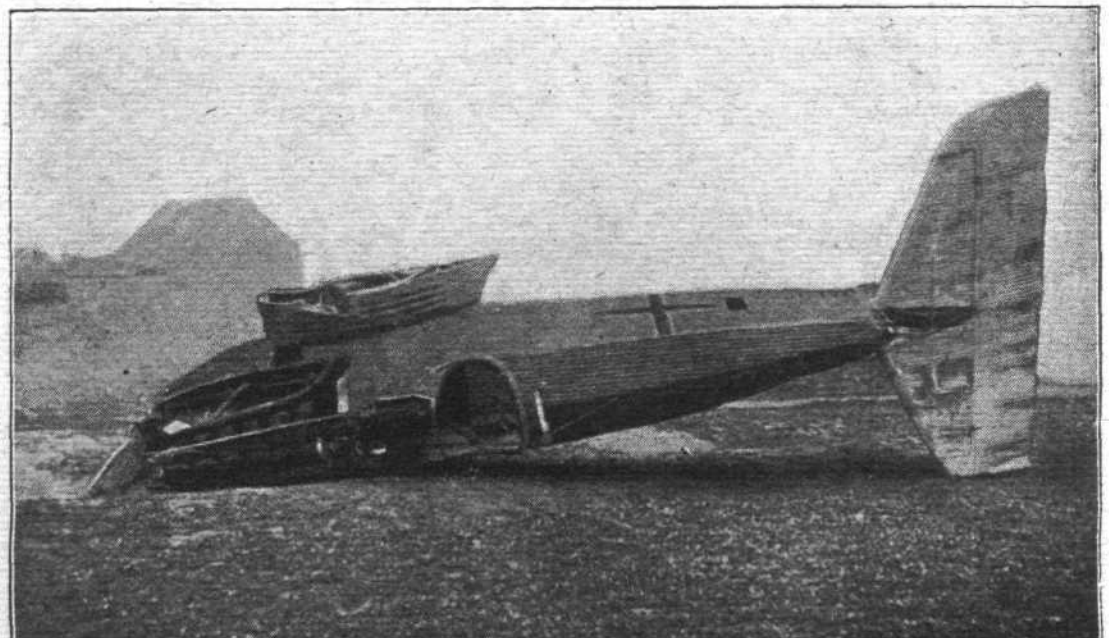


Fig. 22



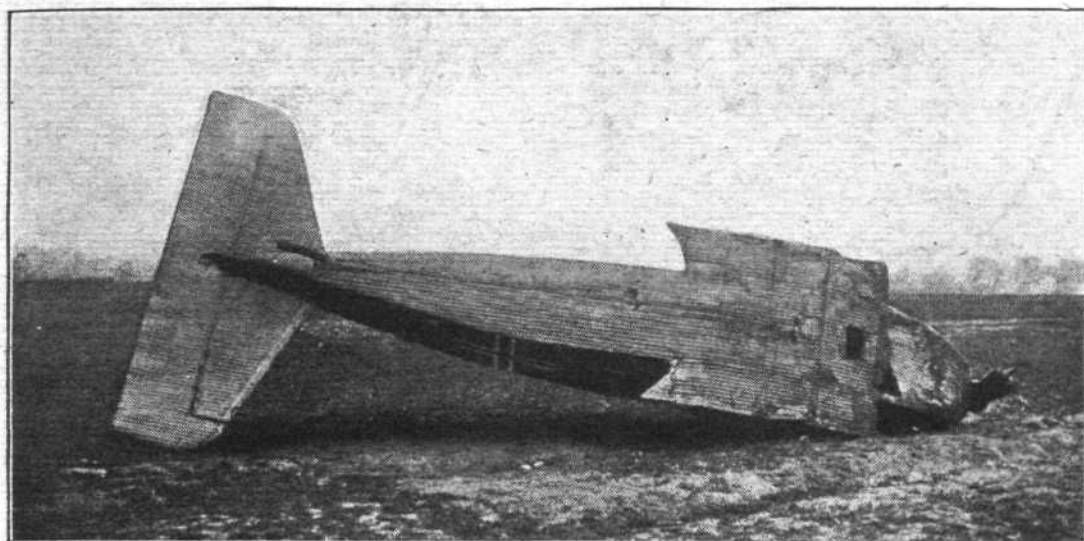


Fig. 23

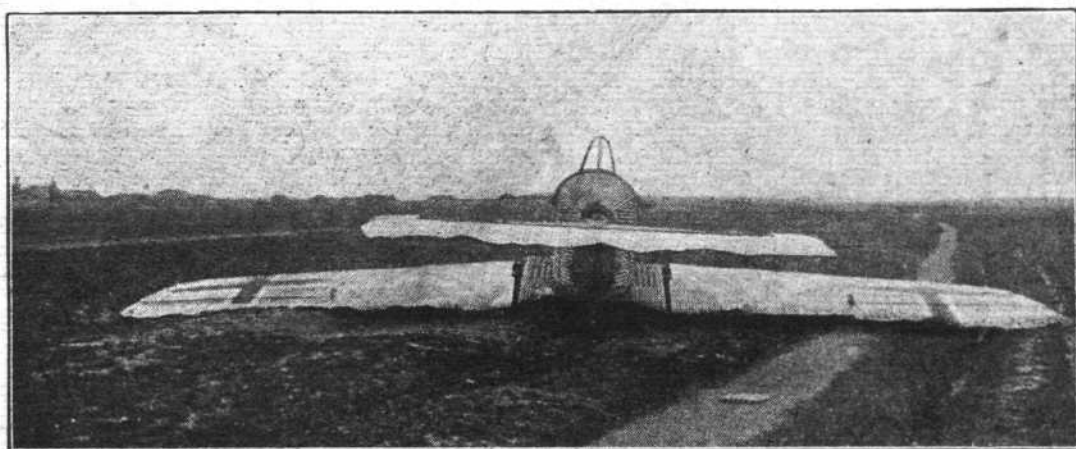


Fig. 24

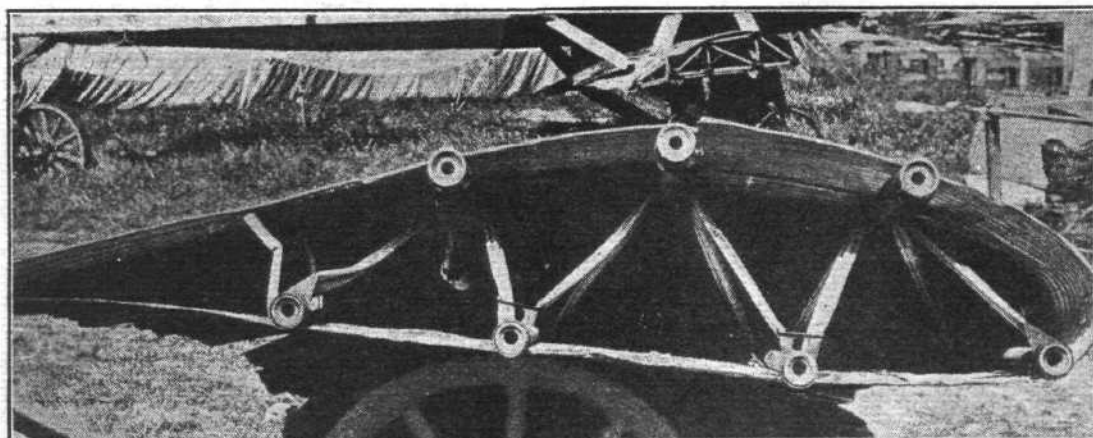


Fig. 25.—View
looking into the
port wing

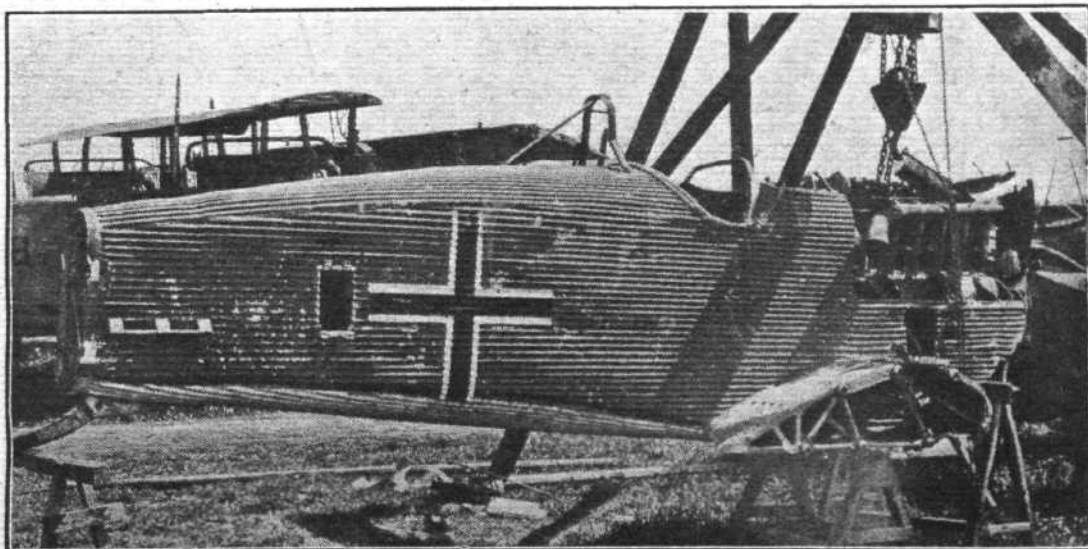


Fig. 26.—View of
starboard side of
the dismantled
aeroplane

translated inscriptions. The dash itself consists of two separate aluminium sheets as shown, with discs crudely inscribed. The actual cocks had been removed. The evidence of the inscriptions is obvious.

Radiator

It is evident from the photographs, and from various traces that still remain on the machine, that two separate half-radiators were fitted, one on each side of the engine, at the front of the fuselage. (See view of complete machine.)

The positive shutter control can still be traced from the pilot's seat to each half-radiator.

Painting

The body is painted a chocolate-brown colour, except underneath, where a white pigment has been applied. The wings are painted a pale green, with irregular patches of light mauve on top, and white underneath. The tail planes and elevator are white above and below.

Close examination revealed the fact that under the layer of chocolate paint on the body was a layer of pale green

colour, and a similar colour could be seen on the tail planes, wherever the white had peeled off. The chocolate and white were all flat, unvaried colour. Careful scrutiny of the fuselage side revealed the fact that on the top of the green colour, on the starboard side, the inscription "JUNK.D.I." had been painted—the slightly-raised edges of the letters could just be traced. This had been obliterated by the chocolate paint, but is important as evidence that a German single-seater fighter may be put in the "D" class, whether monoplane or biplane. On the other hand is the case of the Fokker monoplane, also a single-seater fighter, known by the old-style classification E. (for *eindecker*, i.e., monoplane).

Armament

The photographs show two Spandau guns, fixed on channel duralumin bearers, immediately in front of the pilot. They are fired in the usual manner through interrupter gears controlled from the joystick. Nothing unusual was noticed with regard to the aluminium chutes and ammunition magazines.

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

AIRBRAKES AND THE SIDESLIP LANDING.

[2011] I have read with great interest, Lieut. Courtney's article on "Airbrakes and the Sideslip Landing," and also your preface to same, and as I am one of those to whom you extended an invitation to express opinions, I should like to trespass on your time for a few moments.

The first point is with regard to your reference to high landing speeds. Let us consider what is "Landing Speed." Landing speed is the speed at which a machine ceases to fly. In landing, it is customary to glide in and hold off a few inches from the ground until the machine ceases to fly, and drops these few inches to the ground. Due warning is usually given by the controls becoming "sloppy" that this drop is about to take place, and whilst there is still sufficient control, the tail is helped to drop in time to make a three-point landing. Assuming that the machine is allowed to land as above, and is not forced onto the ground, the distance run in pulling up on any machine will be quite short, so that, provided the pilot arranges to make his landing reasonably close to the near boundary of the aerodrome, there should be little difficulty in pulling up. It is coming in at too high a speed and being obliged to hold off whilst half the aerodrome is crossed waiting for the speed to drop to landing speed that constitutes what is usually termed a fast landing.

I have not flown any post-War machines, but have flown most Service types, and I do not remember any machine that would run far once it was on the ground.

Say we take up a type of machine we have never flown before. Let us go up a few hundred feet and find out its landing speed. Shut off the engine and hold her level until she drops her nose, and note the speed at which she does so: say it is 45 m.p.h. Now add 10 m.p.h. to this, and try flying the machine on the glide at 55 m.p.h. to see if the controls are quite effective and whether there is a suspicion of stalling. If everything is O.K., we may cut things a little finer and glide about at 50 m.p.h., and we will probably find that while two of the controls are quite tight, the third is "sloppy." We decide, therefore, to bring the machine down to land at 55 m.p.h. We find we come in well under control, we hold off only for a few yards and the machine "settles" (as the farmers put it), and we are surprised at the ease with which the machine lands, especially as someone has probably told us it is "dangerous and must be brought in at least at 75." Should the day be very rough, we give the machine another 5 m.p.h. on the glide, and, of course, hold off a correspondingly greater distance.

I recollect seeing a pilot bring in a Bristol monoplane to land at a speed I should put at about 80 m.p.h. He was obliged to hold off almost the full length of the aerodrome, and only just pulled up within its boundary. I noticed, however, that the distance actually run on the ground was quite short. I had never flown this breed before, and when I first took it up I applied the above methods of finding its landing speed. I found that it would glide almost as slowly as an Avro under perfect control, but to keep it at it required about a 14-lb. backward pull on the stick. (This machine was very nose-heavy with the engine off.) I brought it in to land with a 10 m.p.h. margin, and found I had to hold off about five lengths before it "settled." I had been thinking of the previous time I had seen it flown, and came in very close over the near hedge to have ample margin. When I looked

back, having come to rest, the hedge was only 50 yards behind me. After this first effort, I always brought this machine in as above and had no trouble at all, and had enough confidence to put it into any field in which an Avro could pull up.

The point I have endeavoured to bring out is that there are so many pilots who glide at 30 or 40 m.p.h. in excess of the landing speed and then complain that the machine "lands fast." I noticed the "most-talked-of pilot of last summer" while flying at Hendon would come gliding in to land at a very comfortable speed for a quiet landing, and when about 150 ft. up would do a little dive for about 100 ft., and, in consequence, float half-way across the aerodrome before the machine touched. Why he did it has always been a mystery to me.

Now, to deal with airbrakes. Why glide at a speed so much in excess of the landing speed that an airbrake is necessary? Lieut. Courtney's remarks on side-slipping as an aid to judging distance are very sound, but his application of his airbrake when gliding strikes me as being misleading. Braking is taking off speed. Should he have that excess of speed to take off? I do not think the term "airbrake" should be used when speaking of gliding in to land. By all means, swing your tail when practically on the ground, and so use your airbrake to take off at once that 10 m.p.h. you have to lose by holding off, and stop. This is the only time your keel surface is used as a true "brake." It is obvious that, in side-slipping in to land, you must not lose forward speed, otherwise the machine stalls. Correct side-slipping needs practice on all machines, and to be useful in landing one must be able to hold the nose at such an angle that on coming out into the normal gliding angle of the machine, no excess of speed has been gathered. I think that many readers will agree with me that the noses of some scouts have to be held amazingly high in a sideslip to obviate this.

There is a point which I think Lieut. Courtney forgot to mention, and I feel sure that he will agree with me, and that he does it himself. I refer to maintenance of direction in sideslip. When gliding in to land, one selects a spot on the aerodrome for one's landing, and glides towards it at normal gliding speed with, as Lieut. Courtney says, plenty of height. A sideslip becomes necessary and the machine is put into one, but in such a way that, whilst slipping, direction is maintained towards the spot selected. To do this, the nose of the machine must be swung well out to the left or right, otherwise one is liable to sideslip off one's course.

It is entirely a matter of opinion, of course, but rather than come down in the steps depicted on your page 368, I should prefer to arrive at the point A looking along the side of the machine at the spot selected, and then swing the nose gently round, say, to the left, and put the right wing down and sideslip gently at the spot all the way, increasing or decreasing the slip as necessary. This is a very comfortable method, and gives one a good view of the spot all the time, and there is no control wagging or work attached to it.

Why the Air Ministry objects to sideslip landings is quite a mystery. I can picture the pilot (rare specimen) who always did what he was told, forced landing a machine full of passengers in a small field arriving over the hedge too high and overshooting in compliance with Regulations for want of a little sideslip.

Lancaster Gate, April 4.

E. J. D.

Air Brakes and the Sideslip Landing.

[2012] I was very interested to see an article on sideslipping in a recent issue of your journal, and as you invite correspondence on the subject, may I hold forth?

I would first like to answer your remark that side-slipping when there is a high wind is dangerous. This is not so, as almost invariably one slips into wind, sometimes across wind, but never down wind. The higher the wind, therefore, the less the resulting drift from the sideslip, and drift is the cause of crashes from sideslips. In addition to this, the idea of a sideslip when landing is to cover as little ground as possible in the glide. When there is a high wind, one seldom finds it necessary to sideslip. Who has seen a pilot overshoot on a windy day?

The idea of sideslips, cross wind landings, cross wind take-offs, etc., had become fairly general in our training of pupils since the beginning of 1918, chiefly due to the enthusiastic efforts of a certain Lieut.-Colonel and his school. The difficulty has been to get any average pilot with his wings to ask "how to loop," "how to land cross wind," and how to do a hundred, and one other simple manœuvres, which almost everyone could do—indifferently.

"R.A.F."

[When we referred to the possible risk of the sideslip landing in a wind, we had in mind a *gusty* wind. A steady wind would not, of course, present any difficulties, but a wind is seldom steady, near the ground at any rate, and hence there is more likelihood of a machine getting caught in a gust on a windy than on a calm day.—Ed.]

FLYING RACES AND OPEN EVENTS.

[2013] I see that, in Letter 2010, Mr. Thornburn asks that at least one of the races to be held at Hendon this season should be open to aircraft of the Allied Nations. This suggests the old question of whether the ex-enemy nations should be

The Olympia Aero Show

It has now been announced that the sixth International Aero Exhibition, to be held under the joint management of the Society of British Aircraft Constructors, Ltd., and the Society of Motor Manufacturers and Traders, Ltd., will be opened at Olympia on July 9 and will close on July 20. Entries will be received until May 3.

On the opening day the exhibition will be on view to the public from 2 to 8 p.m., and afterwards on every week-day from 10 to 8.

It was at one time suggested that the exhibition should be held at Hendon, but this was found to be impracticable, and now, by arrangement with Mr. Handley Page, Cricklewood Aerodrome has been secured for exhibition flights in connection with the show at Olympia.

It is intended that the exhibition shall embrace aircraft of all types, aircraft engines, propellers, models, components, accessories and materials, and plant used in their construction. If space is available there will be a special historical section, in which machines used in famous flights will be shown, together with many specimens of early machines and aeronautical souvenirs and relics. The allotment of space in the aircraft section will be made at the discretion of the committee, consideration being given to the special requirements of each exhibit in matters such as minimum dimensions, head room, and so forth. Applicants will ballot for choice of position in the other sections. It is stated in the regulations that exhibits may be shown in motion generally operated by electric power, but no exhibits may be operated by petrol or other fuel having a lower flash-point than 73° F. Nor will any such fuel be allowed in the exhibition for any purposes. The Air Ministry is arranging to instal wireless telegraphy and telephony equipment for demonstration purposes.

Efforts are being made to make the exhibition truly international in character, and many communications have been received from abroad relating to the exhibition of foreign aeronautical products.

Officers' Full Dress, Royal Air Force.

It is notified that a pattern of Full Dress Uniform for Officers of the Royal Air Force has been approved by His Majesty the King. The provision of this uniform by any Officers of the Royal Air Force is entirely optional at the present time. The material of which this uniform is to be made is the same as that of the Mess Dress.

Tunic.—Single-breasted, seven buttons (bottom button half inch below waist seam). Collar, 2½ ins. high, square fronts, one row of ½ in. gold lace, running up the fronts and round top of collar, traced ½ in. below with ½ in. gold lace. One row of ¼ in. gold lace round bottom edge of collar.

Ranks Pilot Officers to Flight Lieutenants have a device of five oak leaves in gold embroidery in front of each side of

allowed to compete. I yield to none in my abhorrence of the Huns' deeds in the late War, but at the same time I do believe that at least one truly international event, open to aircraft of any country under the sun, should be held each year. I urge this, in our own interests, for I believe British—or, at any rate, Allied—aircraft can beat anything the Huns or neutrals could put in the field, whereas our present attitude of boycotting the Central Powers, though very pleasant from the sentimental point of view, suggests to neutral and other prospective buyers, that we are afraid to meet the Huns, and doubt our capacity to beat them. No one wants them to come over here, but in this case we should benefit if they did.

So let 'em all come!

CHARLES H. N. MORRIS.

PARACHUTES.

[2014] The photographs in your issue, April 8, of the fallen Fokker are very interesting from every point of view. The machine apparently crashed from 6,000 ft., and if the pilot had been equipped with any good "free" parachute system, he should have had a fair chance of escape. But we are told that the upper plane broke away, leaving behind the struts in the fuselage and lower wing, and it is permissible to speculate what, under the circumstances, the odds would have been against any "anchored" parachute, even one so good as the *Salvus*, getting clear and landing its passenger in safety. As Mr. Smith admirably defines it, "parachute efficiency (used in the larger sense) is synonymous with successful functioning under widely varying conditions." For my own part, I should be sorry to devote an hour to the design of a parachute for dropping from London Bridge, or even for regular demonstration descents at aerodromes, if only because existing parachute systems are good enough for this work.

H. S. HOLT.

Cavalry Club, Piccadilly, W. April 10.

the collar. Ranks Squadron-Leader to Group-Captain have oak leaves and acorns of gold embroidery similarly placed and running 3½ ins. from front to back of collar. Air Officers have the latter device running all round the collar. The cuffs are plain in the case of all ranks. Rings denoting rank, as in the case of service dress, but of gold lace, will be worn on each sleeve.

Trousers.—These are without "turn-ups" at bottom and without foot straps. The same pattern is worn with both full dress and mess dress.

Boots.—Half Wellingtons.

Gloves.—White leather.

Sword.—The sword is of the straight pattern with gilt hilt. The sword belt and slings, as also the scabbard, are of black leather with gilt fittings. The fittings of the scabbard and slings differ in the case of air officers, being of somewhat more ornate design.

Head Dress.—For the time being a dress cap of similar design to that approved with the old pattern blue service dress (including gold oak leaves denoting field and air rank) will be worn, the only difference in this cap being that the cloth will be similar to that used for the full dress. Cap badge as for service dress. This cap will also be worn with mess dress.

Patterns can be seen on application to Room 177, Air Ministry, Empire House, Kingsway, W.C. 2.

Submarine and Aerial Cruisers.

LECTURING before the United Services Institution the other day on "Submarines and Future Naval Warfare," Lieut. King Hall, dealing with the cruiser, said that cruisers employed on screening and scouting duties with a fleet would be of aerial and surface type, working in co-operation. Cruisers employed on *guerre-de-course* would be of submersible type and they would destroy shipping by gunfire. These craft would be particularly suited to our enemies and appeared to be the greatest future naval danger of the Empire. Cruisers employed against these raiders must be of aerial and submarine type, working in conjunction. If a potential enemy were known to be building these commerce-destroying submarine cruisers, we should lay down a special class of ship for convoy escort in time of war.

Admiral Sir Doveton Sturdee, who presided, said that it was most important that submarines and aircraft should work together in absolute sympathy and co-operation. Aircraft had been of great assistance in the war, and would be of greater use in the future for reconnaissance as well as for convoy purposes. He thought kite balloons were a mistake because they marked a spot; sometimes they blew away; and sometimes they could not be brought down. He thought the aeroplane that went off a battleship's deck and came back was better if we could have it.

SOME GÖTTINGEN TESTS ON THICK SECTIONS

THE following extracts from the German Technical Reports (Technische Berichte) of wind-tunnel tests at the Göttingen Laboratory, which corresponds to our N.P.L., have been received from the Controller of Information, Air Ministry. It is to be regretted that the diagrams of the sections, as sent out by the Air Ministry (and which we have merely traced), are very roughly drawn, and, therefore, represent the actual sections in a general way only. They serve, however, to give a rough indication of the shape of each section, although they are, of course, useless as models from which to plot full-size wing sections. We believe that in the actual Technische Berichte silhouettes are given of all the models tested, and that these silhouettes are to the same scale as the actual models, being in fact produced by tracing inside the template used in making the model section. If the Air Ministry would have taken the trouble to issue these sections actual size, as published in the T.B., the usefulness of the diagrams would have been vastly enhanced.

With regard to the units employed by Göttingen, a few words of explanation may not be amiss, since it will be seen that they do not in the slightest resemble those used by Eiffel, nor the "absolute" coefficients employed by our own N.P.L., nor those commonly found in American National Advisory Committee reports. We understand that it is the custom of Göttingen to refer the results of tests on model wing sections to a speed of 40 metres per second, using metres, seconds, and kilogram units. Eiffel's results, on the other hand, are referred to a speed of 1 metre per second, the coefficients given by him being the lift, in kilogrammes per square metre, at a speed of 1 metre per second. It therefore follows that, as lift varies as the square of the speed, we can convert the Göttingen coefficients into Eiffels by dividing the former by 40². It is also well known that Eiffel's coefficients are converted into the "absolute" coefficients of the N.P.L. by multiplying by 8. To convert Göttingen coefficients into "absolute" coefficients the Göttingen figures must, therefore, be multiplied by 8 and divided by 1600, i.e., the Göttingen coefficient divided by 200 gives the equivalent "absolute" coefficient. In the accompanying tables the dimensions of the models are given by b and t , b being the span of the model, and t the chord.

It will be seen that although these sections have remarkably high maximum lift coefficients, the L/D ratios are in every case very inferior. This is to be expected since the sections tested were uniform both in camber and chord. By tapering them better results could undoubtedly be obtained. One of the sections, No. 244, has a maximum lift coefficient ("absolute") of .9, which is considerably in excess of any sections tested so far at the N.P.L., and by suitably grading such a section there is little doubt that a very much better L/D could be obtained, while at the same time retaining a maximum lift coefficient of the whole wing of between .7 and .8. We have repeatedly urged that our experimenters should turn their attention to the examination of thick tapered wings, and the German figures published herewith merely serve to confirm our belief that there are great, and as yet almost untouched, possibilities in this form of wing. —Ed.

EXTRACTS FROM GERMAN TECHNICAL REPORTS (TECHNISCHE BERICHTE) II 3

Tests on Wing Sections at Göttingen, pp. 407

Among the many sections tested the following highly cambered, thick wings are considered to be of the greatest interest:—

They give remarkably high maximum lift coefficients, and are characterised by a peculiar shape, as will be seen from the attached diagrams.

The maximum L/D ratio for these wings is bad (under 13 in every case); however, they are suitable for cantilever wing construction, and it follows that the L/D of the complete aircraft may be high, owing to the absence of external bracing.

At the same time the high maximum lift coefficient should greatly reduce the wing surface necessary for a given landing speed.

It is remarkable that instability of air flow at large angles only occurs in two of the sections of this type, No. 224, No. 243 (the figures of which are not attached).

Section No. 222, Model No. 719, Corresponding to M.V.A.H. 33 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

Angle of Incidence	Ky	Kx	Moment of C.P.	L/D
— 9°	13.7	3.7	22.7	3.7
— 6	37.8	4.2	28.9	8.9
— 4.5	48.6	4.7	..	10.3
— 3	60.6	5.6	35.0	10.8
— 1.5	71.0	6.3	..	11.3
0	84.0	7.4	41.1	11.1
1.5	94.2	8.7	..	10.8
3	105.7	10.2	46.9	10.3
4.5	114.0	11.6	..	9.8
6	123.9	13.5	51.4	9.2
9	142.3	17.1	55.9	8.4
12	156.0	21.1	59.9	7.4
15	162.0	25.5	58.4	6.4

Section No. 223, Model No. 720, Corresponding to M.V.A.H. 34 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

Angle of Incidence	Ky	Kx	Moment of C.P.	L/D
— 12°	10.2	4.5	11.7	— 2.3
— 9	10.5	3.1	18.3	3.3
— 7.5	21.4	3.1	..	7.0
— 6	32.8	3.5	24.0	9.4
— 4.5	44.6	4.1	..	10.8
— 3	55.2	4.9	30.0	11.2
— 1.5	66.5	5.8	..	11.4
0	79.0	7.0	36.2	11.3
1.5	89.0	8.2	..	10.7
3	100.0	10.0	42.7	10.1
6	122.5	13.7	47.7	9.0
9	141.0	17.8	54.0	8.0
12	158.5	22.9	58.6	6.9
15	161.0	28.4	59.3	5.7

Section No. 225, Model No. 726, Corresponding to M.V.A.H. 35 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

Angle of Incidence	Ky	Kx	Moment of C.P.	L/D
— 12°	— 6.2	12.3	4.4	— 0.5
— 9	0.5	10.3	8.7	0.1
— 7.5	7.0	8.8	12.4	0.8
— 6	24.8	4.3	25.8	5.8
— 4.5	37.8	4.0	..	9.4
— 3	49.4	4.4	32.6	11.3
— 1.5	61.6	5.1	..	12.0
0	72.0	6.1	38.3	11.9
1.5	83.4	7.1	..	11.7
3	95.0	8.5	44.0	11.2
6	117.0	11.4	49.0	10.2
9	136.1	15.2	53.8	9.0
12	154.2	19.7	57.5	7.0
15	162.0	24.8	59.0	6.5

Section No. 227, Model No. 728, Corresponding to M.V.A.H. 37 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

Angle of Incidence	Ky	Kx	Moment of C.P.	L/D
— 12°	— 5.4	13.2	3.3	0.4
— 9	1.7	10.0	8.8	0.2
— 7.5	11.2	7.4	15.2	1.5
— 6	28.2	3.8	25.8	7.5
— 4.5	40.0	3.9	..	10.3
— 3	51.2	4.4	32.2	11.6
— 1.5	64.6	5.2	..	12.5
0	74.8	6.2	38.3	12.1
1.5	86.3	7.4	..	11.7
3	97.5	8.9	44.2	11.0
6	119.6	12.1	49.8	9.9
9	140.4	16.1	55.3	8.7
12	158.5	20.6	59.6	7.7
15	167.9	25.6	61.7	6.6

Section No. 233, Model No. 736, Corresponding to M.V.A.Ca. $b = 720 \text{ mm.}, t = 120 \text{ mm.}$

Angle of Incidence	Ky	Kx	Moment of C.P.	L/D
— 9°	— 9.8	11.6	3.3	— 0.8
— 6	21.0	4.1	22.5	5.1
— 4.5	36.6	3.7	..	9.8
— 3	51.9	4.1	32.4	12.6
— 1.5	62.3	5.2	..	12.0
0	73.4	6.2	36.9	11.7
1.5	84.7	7.3	..	11.6
3	96.9	8.8	42.0	11.0
4.5	109.0	10.4	..	10.6
6	122.8	12.1	51.6	10.2
9	144.5	15.9	52.8	9.0
12	158.0	20.4	56.4	7.9
15	166.0	25.9	55.8	6.5
18	153.5	28.9	50.1	5.7

Section No. 234, Model No. 737, Corresponding to M.V.A.Ca.5
 $b = 720 \text{ mm.}, t = 120 \text{ mm.}$

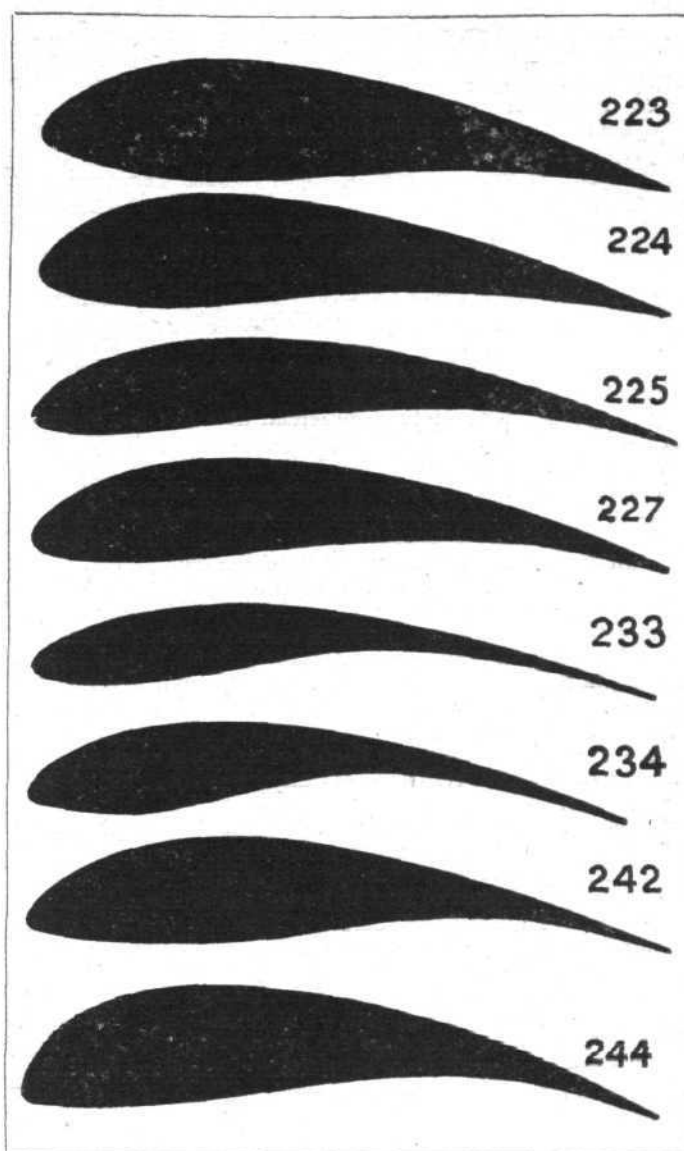
— 9°	— 0,8	11,8	7,5	— 0,1
— 6	22,5	5,2	27,0	5,5
— 4,5	45,6	5,2	..	8,8
— 3	57,7	6,1	36,6	9,4
— 1,5	63,0	7,5	..	8,4
— 0	78,1	8,4	38,7	9,3
1,5	89,9	9,2	..	9,8
3	102,0	10,2	45,5	10,2
4,5	118,6	11,8	..	10,0
6	131,0	13,6	55,3	9,7
9	153,8	17,3	62,2	8,9
12	173,5	22,0	67,5	7,9
15	179,0	25,9	66,6	6,9
18	175,0	31,3	66,3	5,6

Section No. 242, Model No. 747, Corresponding to M.V.A.Pr.2
 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

— 9°	1,6	10,9	7,4	0,2
— 6	21,6	3,9	22,6	5,6
— 4,5	34,5	4,0	..	8,7
— 3	46,5	4,1	30,4	11,1
— 1,5	59,4	4,9	..	12,2
0	69,9	5,9	36,4	11,8
1,5	81,9	7,3	..	11,2
3	93,0	8,5	42,5	11,0
4,5	103,5	10,0	..	10,4
6	115,0	11,7	47,8	9,8
9	137,5	15,7	53,5	8,7
12	157,0	20,0	59,0	7,8
15	173,9	24,8	62,7	7,0

Section No. 244, Model No. 749, Corresponding to M.V.A.Pr.4,
 $b = 800 \text{ mm.}, t = 160 \text{ mm.}$

— 12°	23,9	14,1	15,1	1,7
— 9	29,5	12,1	17,3	2,4
— 7,5	29,6	11,4	..	2,6
— 6	31,9	10,6	18,2	3,0
— 4,5	39,0	9,8	..	4,0
— 3	60,5	7,2	38,4	8,4
— 1,5	78,5	7,6	..	10,4
0	89,5	8,4	48,8	10,7
1,5	104,0	9,9	..	10,5
3	113,0	11,5	55,9	9,8
6	135,0	15,2	61,5	8,9
9	152,0	19,6	66,1	7,8
12	171,0	24,3	71,1	7,0
15	180,5	29,0	73,0	6,2



TRANS-CONTINENTAL FLYING

BY CAPTAIN P. D. ACLAND

It was a very able and interesting paper, under above title, which Capt. Acland read before the Royal Aeronautical Society on Wednesday, April 14. As general manager of Messrs. Vickers, Ltd., Aviation department, Capt Acland has naturally had excellent opportunities for making a close study of the problems of transcontinental flying (and trans-oceanic also, for that matter), with what success will be realised when one calls to mind the historical flights made by Vickers-Vimy-Rolls Royce machines during last year—the crossing of the Atlantic by the late Sir John Alcock and Sir Arthur Whitten Brown, the flight to Australia by Sir Ross Smith and his companions, and various African flights.

The lecturer commenced his paper with a brief statement of the condition of affairs shortly after the Armistice of 1918, and pointed out the fact that constructors, at the cessation of hostilities, had their minds turned towards manufacture and production rather than to operation, and that they had, in a moment, to alter their ideas to visualise a reduced output. He then gave a brief description of the machine used by Vickers for their famous flights of 1919—the "Vimy," together with a list of the staff and equipment sent out to Newfoundland for the trans-Atlantic flight.

The lecturer then dealt with the organisation and equipment of the Vickers-Vimy which was flown by Sir Ross Smith from London to Australia. Sir Ross Smith in his letters has given a few tips which, Capt. Acland said, may be useful:—

"Utmost importance to keep oil clean and watch mixture carefully, owing to needle valve seatings wearing. Completely change oil every 20 hours, cruise under 1,700 revolutions, strain thoroughly petrol, oil and water, clean all strainers and check clearances often. Have water-pump gland well packed with grease and screw it only thumb-tight. Strip

pumps every 30 hours, spray valves and guides with kerosene vapour after flight to prevent sticking. Watch holding-down bolts for engine very carefully owing to shrinkage of engine-bearers. Use brass-bound propellers as ours and always cover from sun. Turn radiator overflow pipes into wind, keep tyres fairly soft, watch oil ways to rocker arms.

"He further recommends, the lecturer said, that boards should be carried for locking the *ailerons* when the machine is pegged down for the night, and that all control-pulleys should be replaced with sprockets, and the cable at that position superseded by chains. He also suggests that an additional four magnetos, 24 contact-breakers, two sets of needle-valves, seatings for float-chambers, a small vulcaniser for tyre repairs, and one of the most important things, a strong lifting-jack should also be carried, as he broke four during this flight."

The lecturer, after pointing out the proof furnished by the Australian flight, that the linking-up of far-distant sections of the Empire with the Home Country is possible at a speed which cannot be attained by any other known means of transport, referred next to the African flights regarding which, he said, there was little technical information available beyond that already published in the Press. The flights appeared to have been a succession of matters connected with the engine, indicating that engines are not yet available which can stand up against the severe conditions of a flight throughout the entire length of the continent of Africa. Regarding the criticisms which had been levelled against the African flight, Capt. Acland said:—

"The reply one would make to this is that certainly engine failures were frequent, but is it not a fact that when trouble developed it was impossible, owing to the elementary state

of this air route, to obtain spare parts at each halting-place and so keep the machine in commission? It is usual in all kinds of transport to have depots where repairs can be effected, but in this instance it is obvious that these facilities could not exist until the air route was definitely open for traffic, as the necessary expense would not have been warranted from the point of view of the Air Ministry, who could not know what machines would attempt this pioneer flight. From our point of view there was not time to put supplies of aeroplane and engine parts all along the route awaiting the machine, as the flight was undertaken at a time when speed was essential in order to race the weather. Equally, the apparatus was not specially designed for flying through these climates, but we were merely trying out a type from which we could draw conclusions and make special modifications, if necessary, in case of a mail service being inaugurated in South Africa."

Turning his attention to commercial aviation the lecturer said:—

"I propose to look into the question rather from the financial side and to give a few figures as a basis of discussion in the hope that this may lead the public to appreciate that although the costs of operation are undoubtedly high, the expenditure will be well worth it from the commercial point of view. I do not, of course, take into consideration such points as the necessity for our supremacy in the air, and a healthy flow of machines plying between various points in the globe being an additional safeguard against enemy action at any time, should any unfortunate eventuality occur. I believe a great many of the doubts arise because there is but little reliable evidence to show what it really costs to run an aerial service. Figures have been put up from time to time showing that aerial transit costs anything from 5s. to £50 per ton-mile.

"Generally speaking, in estimating running costs of any service for twelve months the calculations are based on a pessimistic figure for depreciation and a high cost for maintenance. The amount of fuel to be used is easily calculated, but one of our greatest difficulties is insurance. This is not a general market yet, and in view of the comparatively small amount of business done the prices are bound to be high, and if aircraft are operating they must remain so, for in spite of the remarkably few accidents which do occur they bear an unreasonable proportion to the business as a whole.

"I give in Appendix F an estimate for flying between two points about 300 miles apart, assuming that a twin-engined machine of the 'Vimy' type fitted with 'Eagle' Mark VIII Rolls-Royce engines is utilised, and that one ton of goods are carried each way per diem. As a matter of fact this particular machine with full load is capable of carrying over 3,000 lbs., and I think for purposes of making out an estimate it is advisable to make an allowance of about 75 per cent. of our full capacity, which gives us the one-ton load.

"The number of machines required for this service would be six, viz.:—Two flying, two standing by in case of necessity, two in the workshops undergoing overhaul.

"The average mileage per hour is reckoned at 80, which gives a due allowance for head winds, etc. The approximated total flying hours per diem is 7½; and allowing 5 per cent. extra for running engines and testing, we reckon that for a year of 300 days the engines would be turning for 2,360 hours.

"We have further assumed that we will be flying over one of the Imperial routes, paying standard fees for housing and landing in accordance with the Navigation Act. The total capital we reckon at approximately £125,300, which includes six 'Vimys' complete with engines, 33½ per cent. engines spare, 20 per cent. of the value of machines and engines in spare parts, plant and equipment for terminal stations, suitable road transport, wireless equipment, advertising, and making an allowance of approximately £30,000 actually reserved in cash for working capital.

"Taking a small view of aerial transport, a figure of about 1s. 6d. per lb. for transport over 300 miles in an aeroplane does not appear to be excessive, when one considers the large amount of perishable material there is requiring rapid transit between important points in various parts of the world. In view of the remarks I made earlier about insurance, it

would appear that for a start at any rate the normal charge of 2s. 6d. per lb. which is being asked by most operating companies appears to be absolutely fair and justified; in fact I go so far as to say that this may be on the low side. However, with an increase in business a profit should eventually be made, provided the public is educated to make use of flying machines for transport purposes, thus ensuring the machines flying daily with a full load. While speaking in this connection one cannot avoid making reference to the difficult state in which the industry finds itself today. The constructor is at present faced with a peculiar problem. It is realised that the development of aircraft is commercially necessary, and should be hurried forward as fast as possible, but the support which is being received at the moment makes this a very difficult problem from the financial point of view. The aircraft constructor has to manufacture his own machines, which he sells to himself to operate without any support or guaranteed load, and the consequence is that the whole of his reserves of cash are being rapidly expended at a time when hard cash is essential. It appears to me that a solution might be found through a greater co-ordination between various Government Departments, so that the design, research, and manufacturing sides could be separated definitely from the operating side. This might conceivably be done through the Post Office, and possibly the Ministry of Transport, making full use of aircraft and giving guaranteed loads for all transit work which has to be done at great speed. I include in this definitely mails, for there is no doubt about it these must be carried by air, particularly between this country and the Continent. The adjustment of accounts could presumably be arranged between the various Departments concerned; this would to a great measure help to free the Air Ministry to devote more attention and, more important still, money towards research, thus manufacturers would find themselves freed of their present dual anxieties, their design and research going forward strongly and healthily, and at the same time a transport industry growing up outside their works. A further point, I think, which has not yet been discussed in detail, and which I hope to hear more about in the near future, is the formation and development of a Territorial Air Force which might very usefully be inaugurated in conjunction with the mail and transport services I outlined above. I consider that R.A.F. branches of the O.T.C. should be formed at the principal Universities, and thus ensure a supply of the best personnel for training up into first-class pilots. Each line over which it is proposed to work might have appended to it one or more flights engaged on commercial work of this kind, which in times of necessity, such as general mobilisation or other national necessity, might be expanded into service squadrons."

APPENDIX F

Estimated Running Expenses and Upkeep

	£	£
1. Fuel—Petrol, 35 galls. per hour for 2,360 hours for all machines at 4s. per gallon	16,520	
Oil, 2 galls. per hour for 2,360 hours for all machines at 10s. per gall.	2,360	
		18,880
2. Staff		8,820
3. Repairs, Renewals and Upkeep—Spares, plant and equipment transport		13,600
4. Depreciation.—At 400 hours, including equipment and transport		38,100
5. Insurance		11,500
6. Sundry Expenses		3,000
Total		£93,900

Summary of Costs (No Allowance for Dividend)

Approx. total service flying hours at total running cost, £93,900	= say £42 per hour
Approx. total miles covered on service, 80 × 2,250	= 10s. 6d. per mile
Weight carried per machine, 1 ton	= 10s. 6d. per ton mile.
	= 1s. 5d. per lb. for 300 miles.

Air Mail Service to Holland.

FROM an announcement elsewhere in this issue it will be seen that the Postmaster-General, in connection with his negotiations with the Dutch Post Office for an air mail service between the United Kingdom and Holland, asks British firms who are prepared to undertake the conveyance of mails by aeroplane from this country to Holland, to apply to the Secretary, General Post Office, E.C. 1, for a copy of the conditions under which tenders for the outward service are invited.

To Our Readers

As we continually receive complaints from readers that they experience difficulty in obtaining their copy of FLIGHT promptly each week, we draw their attention to the subscription form which is printed on page xxvii of the current issue. If this is sent, accompanied by the appropriate remittance, to the publishing offices, 36, Great Queen Street, W.C., it will ensure FLIGHT being received regularly each week upon the day of publication.

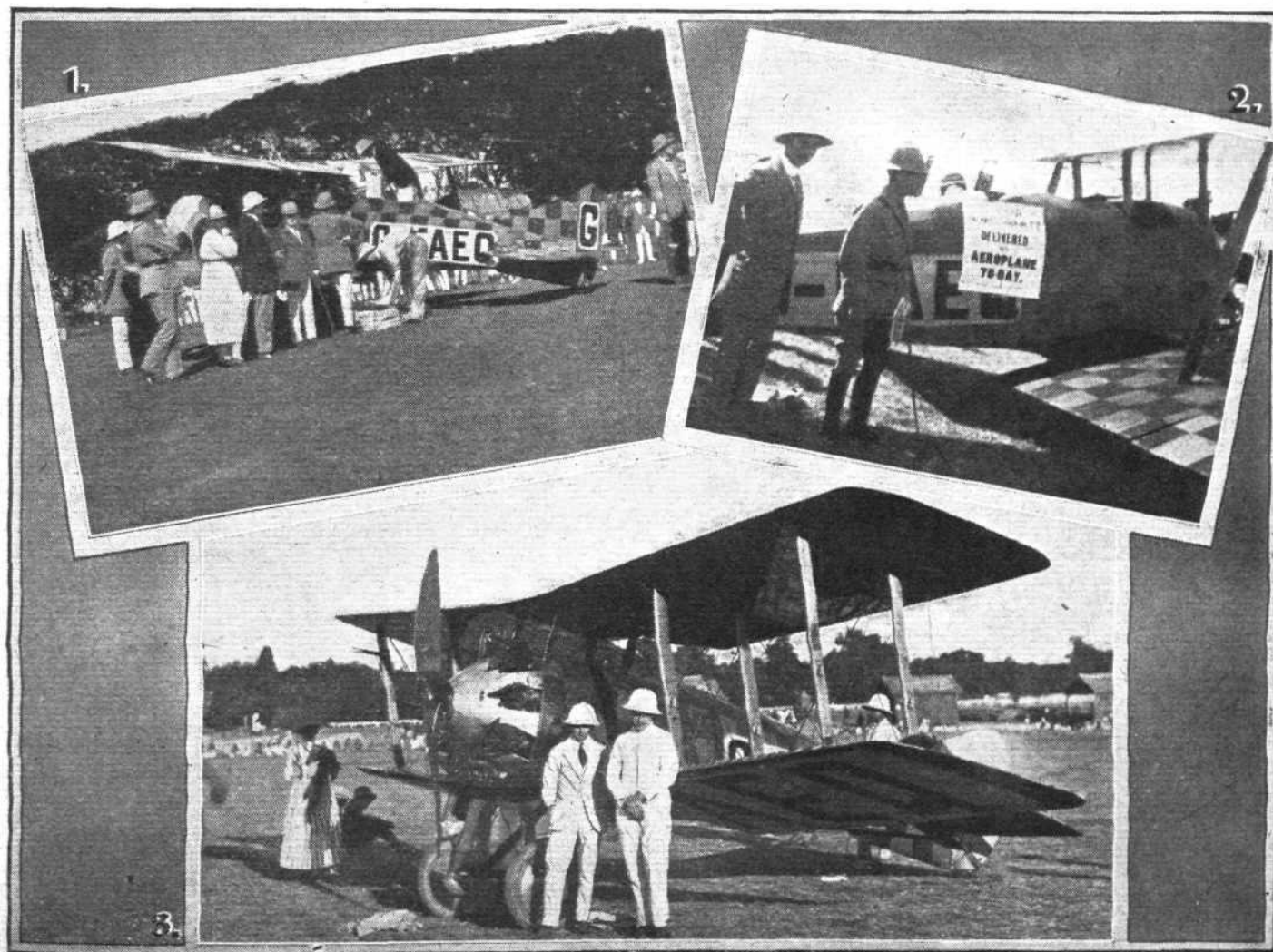
AIRISMS FROM THE FOUR WINDS

ON Monday night the "Army and Air Force (Annual) Bill" was in Parliament read a second time and committed to a Committee of the whole House. This second reading is admittedly a purely formal proceeding, and practically all discussion is closed. But why should the Air Force be mixed up with the Army in this connection any more than the Navy is? It is surely time the Air Force proceeded upon its own. Here again comes in the absurdity, not to say danger, of the one Minister job for Army and Air Force. How will it work out presently when the Air Force is, as it undoubtedly will be, top dog and the Army more or less of a secondary arm to the strategy of the air? We wonder. That the gap between the prime interests of the two must become ever greater and greater is a foregone conclusion, and the sooner the anomalous position of a single Head for both is amended, the better for the Empire.

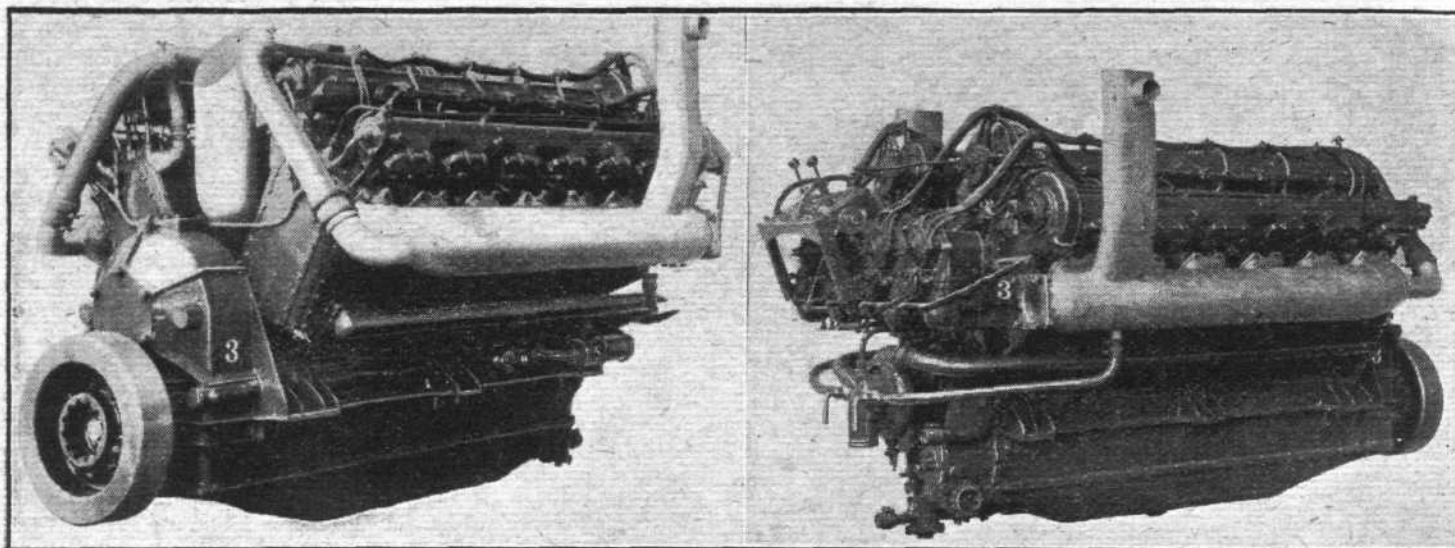
WE note that Viscount Haldane in the House of Lords is on enquiry bent upon the subject of the general policy of

the Committee of Imperial Defence and its relation to the War Staffs of the Navy, Army and Air Force. We hope the dual Ministry farce will have a prominent place in any question raised thereon.

ONE very up-to-date item in the welcoming of our Prince of Wales to California was indulged in at San Diego. In addition to the presence of half-a-dozen American destroyers down the Californian coast, a fleet of 15 seaplanes were told off to manoeuvre round the *Renown*. This contingent was afterwards joined by over a dozen military aeroplanes, the two fleets flying above the Prince's ship in arrow-head formation with trailing Stars and Stripes and Union Jacks. Then followed, on land, the usual reception, and, by way of an informal guard of honour, a goodly gathering of British ex-soldiers, including several Flying Corps men, were lined up in front of the cheering crowd on the water front. Naturally our "chief ambassador" had to speak, as described by a correspondent, "without alluding to politics, with four



A Nieuport "NIGHTHAWK" in India. During the later part of last year the British Nieuport Co. sent a Mission out to India, where some excellent propaganda work was done. The Mission was under the leadership of Capt. R. S. Carroll, who had with him Lieut. J. H. James, one of the Nieuport test pilots. On arriving in Bombay the "Nighthawk" was uncrated and erected in record time, and was soon to be seen flying over Bombay. While in India a great number of flights were made, among others one from Bombay to Poona with a load of newspapers. Our photographs show: 1. Getting ready at Bombay for the flight to Poona. 2. The arrival of the newspapers at Poona. 3. The machine just after arrival at Poona. On the left is Lieut. James, and on the right Capt. Carroll. The Nieuport caused great interest throughout the districts visited, and its handling was much admired. During the next few years India should offer a good field for commercial aviation, and Major Heckstall Smith is to be congratulated on his enterprise in introducing the Nieuport machine to the residents of India.



The 12-cylindered 425 h.p. Sunbeam-Matabele Aero-type engine fitted in the Despujols record-breaking skimmer.

cinematographs staring within a few feet of him, and with the huge horns of the 'Magnavox' in front of his face, this instrument carrying the sound to the farthestmost parts of the immense building. To add to his worries three aeroplanes made a deafening hum, and the photographers began snapshotting." H.R.H. must indeed be a wonder, as deponent sayeth that he " bore himself splendidly, showing no nervousness and speaking clearly and bravely into the abominable instrument and arousing cheers from the most distant people."

MORE information and " straight talk " to the United States House of Representatives Military Affairs Committee have been forthcoming from Col. Hensley, who was on board R 34 on her Atlantic return journey as the American observer, and whose warning as to the aerial activity and efforts of the Germans we recently referred to. Col. Hensley, upon first-hand information, affirms that had the armistice been postponed for 10 days, a Zeppelin loaded with deadly bombs would have sailed over New York City and attempted to demolish her skyscrapers. Col. Hensley states the Zeppelin was ready to make the flight on the day the armistice was signed, and was due there on November 21. He talked to the pilot of the airship while in Germany, and obtained some interesting details which would have restrained members of the Military Affairs Committee had they heard them from talking " of our splendid isolation and complete immunity from attack." The colonel told the committee that America might just as well scrap all her air fleet, because it is hopelessly obsolete, and every airship the United States possesses is a flaming coffin. Even the dirigible being purchased by the United States from England is obsolete, he claims, because the Germans have revolutionised airship design and have developed an all-metal type.

We suppose our complacent vote-snatching masters will, one of these days, in face of these various warnings, get a move on to preserve what little there is still left of Britain's " paramount power in the Air."

WHY, presently we shall be having our dearly-beloved Irish brethren putting up a rival bid to their German friends for first place in the air. Their adventurous spirit distinctly inclines that way, as witness the use made out in America by their sisters and their cousins and their aunts, of the channel of the air to emphasise sympathy with the cry for Irish independence. At first these gentle sympathisers contented themselves with displaying banners before the British Embassy at Washington, but this proving somewhat tame in its results, and, moreover, authority stepping in with a veto upon the methods adopted, new tactics were resorted to. Two of the more venturesome obtained an aeroplane, and for several hours they circled above the Embassy, dropping leaflets and an occasional challenge to the police to come up and stop them. Unfortunately for the enterprise, a snowstorm scattered the leaflets everywhere about Washington, and none reached the target aimed at.

FELTHAM District Council appears to be up in arms in connection with the closing by the Air Ministry of the bridge-path through Hanworth Park when it became an aerodrome under Government auspices. The dispute as to the continued interruption of Feltham's inhabitants' right to cross the park by this ancient right of way has now become acute, and members of the Council have decided to assert the public's right by forcing a passage, first notifying the Air Ministry of their intention. Councillor Parker, a bit of a boy of 75 years of age, is a prominent mover in this assertion of right, and it is he who proposes to lead the local " forces " to the attack. If continued by the Government authorities, now that the war necessity for its use has passed, the closing of this right of way would appear to be but another instance of bureaucratic methods of never letting go of a thing it has once grabbed.

THAT must have been a weird experience of Lieutenants Parer and McIntosh, of the Australian Air Force, when, during their little jaunt from England to Australia by air, they flew over the crater of Vesuvius. The heat waves caused



The Sunbeam-engined Despujols skimmer, which recently put up a record speed of 75 m.p.h. on the Seine. On the left the boat at rest, and on the right at speed. In the centre Mr. Louis Coatalen is seen in conversation with M. Despujols.

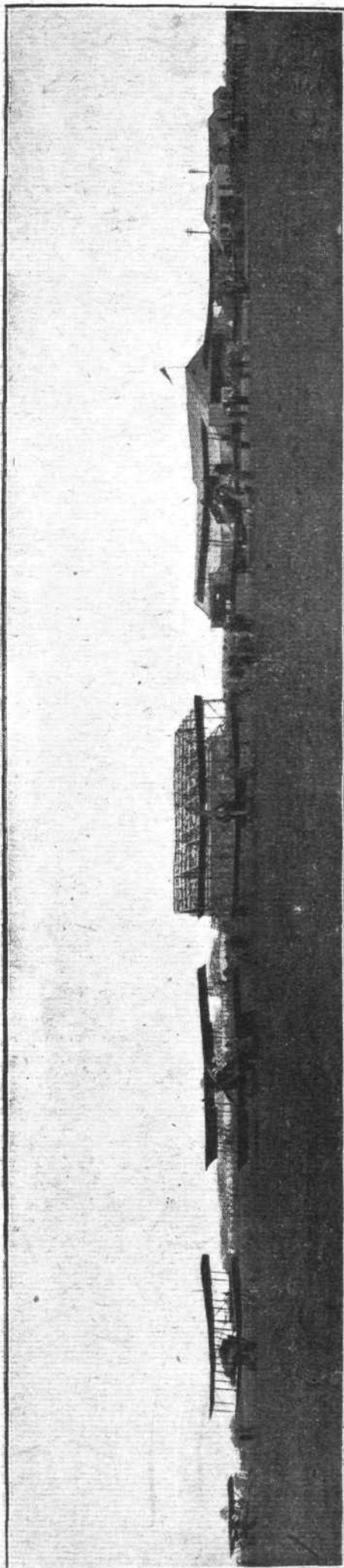


Photo. by J. Reade

The line-up for the cross-country race at Bournemouth on Easter Monday. From left to right the machines are Caudron G. 3 (70 h.p. Renault), F.E. 2b (160 h.p. Beardmore), De H. 6 (80 h.p. Renault), Avro (110 h.p. Le Rhone), Avro (110 h.p. Le Rhone). The course was a double-circuit from the Bournemouth Aerodrome, round Christchurch Priory, a distance of 20 miles.

them, when right over the crater, to drop suddenly 500 ft. or more, and it was a case of touch and go that they were able to get going again beyond the influence of the heat. A distinctly disconcerting experience.

In the Bill providing for the creation of a permanent body in which shall be vested the valuable objects which have been collected during the past three years or more for the Imperial War Museum, there is to be a Board of Trustees of 17 appointed members and seven *ex-officio* members; one of these will be appointed by the Secretary for Air. The Prince of Wales is to be the first President of the Board.

As might have been expected, "pussy-foot" dodgers in America were not likely to miss the obvious opening for getting in the wet goods with the aid of the aeroplane. But equally as might have been expected, the prohibition agents were not likely to overlook this promising means of getting round the law. So far it is about evens. A goodly freight or two have been landed safely, but a catch has been scored by the legal side in a case reported of smuggling across the Canadian border, to Montana, as the "goods" were being landed by means of parachutes.

SUBJECT to any slip-up in the negotiations, the Eastleigh Aerodrome on the Southampton line, one time in the control of the United States Naval Authorities, may possibly be a site for the establishment of the big Ford motor car works in contemplation for this country.

THIS week Willis's Rooms, which were so badly mauled during the last air raid on London on Whit Sunday, 1918, resumed their normal occupation of, amongst other useful objects, an auction room, after a two-years' interval for "decoration and repair." As of yore, the rooms are in the hands of Messrs. Robinson, Fisher and Harding.

ONE recognises that pretty bad and reckless habits were engendered during the War, but with about 18 months in hand from active operations, it's about time the ubiquitous motor transport vehicle began to settle down again to somewhere near normal habits, even in the hands of adventurous R.A.F. men. As a lively example of war tactics still in operation for bringing an R.A.F. lorry to rest, the following report is hard to beat:—

"An R.A.F. motor-lorry skidded in Northgate Street, Canterbury, yesterday, and after colliding with two trucks and a motor van, ran into a house, and the front part of the lorry entered the sitting-room. Much furniture was smashed, and a man named Thomas Hogan was knocked into the fire-place. The lorry was so tightly wedged in the wall that nearly all the front of the house had to be pulled down to release it."

◆ ◆ ◆ ◆ ◆

Cross-Country Race at Bournemouth.

CONSIDERABLE interest was aroused in Bournemouth by the race on Easter Monday from the aerodrome, over a double circuit to Christchurch Priory. There were six entries and the winner was Sergt.-Pilot R. E. Tollerfield, M.M. (Avro-Le-Rhone), who took the prize of 11 guineas and the trophy presented by the Bournemouth Aviation Company, his time for the course of about 20 miles being 20 min. 31 secs. Capt. Matthews (Avro-Le-Rhone) secured second place in 20 min. 51½ secs., Lieut. Carter Smith (F.E.-Beardmore) third and Lieut. F. W. Knox (Avro-Le-Rhone) fourth. Every one of the entrants completed the course, but the other two were disqualified for not complying with the rules.

Captain Matthews in Java.

CAPTAIN MATTHEWS, on his Sopwith Wallaby, landed at Singapore on April 8, and on Monday last, April 12, he was at Batavia (Java).

The Rome-Tokyo Flight.

LIEUT. MASIERO reached Bangkok from Rangoon on March 29. Captain Gordesco and Lieut. Grassi flew from Aleppo to Baghdad on April 7 and reported that another machine, piloted by Captain Ranza and Lieut. Marzari, was shot down with machine-guns by rebel Kurds, about 30 miles outside Aleppo. The machine was afterwards re-captured by Arab troops, and the occupants—one of whom was an Italian ace, who went unscathed through the war—were liberated.

A Bristol for Nicaragua

THE Bristol touring biplane, fitted with 250 h.p. Rolls-Royce engines, which was recently exhibited in New York has been sold to Mr. Joseph F. Thorne, who intends to use it for conveying bullion from his silver mine in Nicaragua to the seaboard. Lieut. Leslie Simmons has been engaged to pilot the machine.

AIRCRAFT WORK IN THE BALTIC

IN his dispatch, dated February 9, 1920, and published in a supplement to the *London Gazette* on April 11, Rear-Admiral Sir Walter Cowan, commanding First Light Cruiser Squadron, describing the operations in the Baltic, during the year commencing January 6, 1919, makes several references to aircraft. In the skirmish with Bolshevik forces off Seskar on May 31, he says a Bolshevik aeroplane appeared overhead and dropped bombs among the British force and flew off eastwards after being fired at. The Fort Krasnaya Gorka had a kite balloon up.

Describing subsequent operations Admiral Cowan says:—

"Later in the month (July) our flying operations started, consisting at first of reconnaissance and photographic flights, and then on the morning of July 30 a bombing operation against the ships in Kronstadt, the main objective being a destroyer depot ship with five or six destroyers lying alongside her. The whole was under the command of Squadron-Leader David G. Donald, A.F.C., R.A.F. Sixteen bombs in all were dropped, and one hit, at any rate, was registered on the depot ship, which disappeared from her accustomed position in the harbour, and was not seen again. All machines returned safely after passing through a heavy anti-aircraft fire from the ships and batteries defending Kronstadt.

"On the morning of August 18, with the object of removing, as far as possible, the threat which existed to my ships and also to the left flank of the Russian advance to Petrograd by the presence of the Bolshevik active squadron, an attack on the ships in Kronstadt by coastal motor boats and aircraft was made.

"The position of the ships in the harbour had been ascertained by aerial photographs. Frequent bombing raids on the harbour had also been made at varying times in the weeks beforehand.

"The attack was planned so that all available aircraft co-operated under Squadron-Leader D. G. Donald, A.F.C., R.A.F., and that they should arrive and bomb the harbour so as to drown the noise of the approach of the coastal motor boats.

"The time-table was most accurately carried out, with the result that the first three coastal motor boats, under Commander Claude C. Dobson, D.S.O., passed the line of forts and entered the harbour with scarcely a shot being fired.

"Each boat had a definite objective—six in all. Of these

six enterprises four were achieved, the results being gained not only by dauntless disciplined bravery at the moment of attack, but by strict attention to, and rehearsal of, every detail beforehand by every member of the personnel, both of the boats and also of the Air Force.

"Of the latter there is this to say, that though all their arrangements for bombing were makeshift, and the aerodrome, from which the land machines had to rise in the dark, was a month before a wilderness of trees and rocks, and in size is quite inadequate, not one of the machines (sea and land) failed to keep to its time-table, or to lend the utmost and most effective support during, and after, the attack to the coastal motor boats.

"After this nothing bigger than a destroyer ever moved again, but a certain amount of mine-laying and sweeping was observed near the approaches to the harbour.

"During September our ships constantly bombarded Bolshevik positions on the Southern shore in Kaporja Bay, in support of the Estonian left flank, whilst the aircraft were employed in bombing Kronstadt and attacking their small craft whenever seen."

Dealing with the retreat of the Russians and Estonians in October to the Narva-Peipus Lake line, Admiral Cowan says:—

"Unfortunately the *Erebus* (Captain John A. Moreton, D.S.O.) arrived only after the attempt was doomed to failure, and by that time also the weather had broken, making it very unsuitable for flying in order to direct the firing of *Erebus*; also our machines and many of the pilots were, from hard service through the summer, rather past their best. The type of machine, too (Short seaplane), was unable to get sufficient height to avoid the very severe and accurate anti-aircraft fire from these two forts.

"All that could be done by our ships (light cruisers and destroyers) besides *Erebus*, in the way of shelling positions and covering the advance, was done, and always within the range of Fort Krasnaya's Gorka's 12-in. guns, and under the observation of its kite balloon."

The losses of R.A.F. personnel were:—

Killed
4 officers, 1 man.
Wounded
2 officers.

The Handley Page Aeroplane Wing

It is stated unofficially that the new type aeroplane wing to which Mr. Handley Page referred in a lecture recently, as permitting the wing area of machines to be reduced to half the present size, and yet possess the same carrying capacity, has been tested independently at the National Physical Laboratory, and the tests are said to have fulfilled the claims made by Mr. Handley Page for the wing.

Air Services in Norway

It is now definitely stated that a daily air service from Toensberg via Fredrikstad and Moss to Christiania and back will be inaugurated about the middle of May. The organisers are a Norwegian firm of aircraft constructors.

Sahara Flight Completed.

MAJOR VUILLEMIN and Lieut. Chalus, by flying from Ptambagunda to Dakar on March 31, completed their flight over the Sahara, during which they had flown 3,500 miles. They started from Algiers on February 6.

A Fast Trip by Roget

On April 7 Lieut. Roget, with a passenger, on a Breguet, fitted with a 300 h.p. Renault motor, equipped with a new turbo-compressor, flew from Villacoublay to Lyons in 1 hour 50 minutes, his average speed being 165 m.p.h. During the trip the machine kept at an altitude of between 18,000 ft. and 20,000 ft.

A Memorial to Vedrines

RENEWED efforts are now being made in Paris to raise a fund with the objects of erecting a monument to the memory of Jules Vedrines, the airman, and providing for his mother, widow, and children.

The members of the organising committee include M. Poincaré ex-President of the French Republic; M. Briand, Marshal Foch, General Berthoulot, Military Governor of Paris; Comte de la Vaulx, Vice-President of the Aero Club of France; and the Marquis de Polignac. The treasurer of the fund is M. Labastie, 7, Place de la Bastille, Paris.

The French Lady Looper

IN connection with the festivities at Rouen during the Easter holidays, Mlle. Bolland looped the loop 25 times, and flew with a passenger under the transporter bridge. It is announced that Mlle. Bolland has been engaged to give a series of exhibitions in various towns in the United States during the coming summer.

U.S. Dirigible Station Sold

THE United States Navy has sold the naval air station at Akron, O., to the Goodyear Tyre and Rubber Co., who intend to use it for the development of dirigibles for commercial purposes. The equipment includes a hangar capable of housing four 163-ft. airships and a hydrogen plant which can produce 100,000 cub. ft. of hydrogen per day. It is also proposed to organise a school for airship pilots.

A Ford Dirigible

FROM a report published in New York it would appear that Mr. Henry Ford has made an offer to the United States Navy Department to erect a plant at Detroit and build an airship of the Zeppelin type for the Government, payment for the airship not to be made until it had carried out its trials and been accepted. It is suggested that a Zeppelin should be purchased, dissembled, and taken to Detroit to serve as a pattern.

The Flying Horse Up-to-Date

THE uses to which the aeroplane is being put are gradually extending, and a noteworthy departure was made on April 8 in California, where a horse, entered for exhibition at Santa Barbara, arrived in a specially constructed aeroplane from Los Angeles. The trip was made without incident, but the start was delayed until the Humane Society was officially convinced that no cruelty would result to the horse.

The Teutonic Idea

AN ex-German flying officer recently applied to Handley Page, Ltd., for a position as a pilot. He enclosed recommendations from German Squadron Commanders under whom he had served on the Western Front, and he stated that he was familiar with English territory, having flown over the Eastern Counties on many occasions! "No vacancy."

PERSONALS

Previously Reported Missing, now Reported Killed
Sec. Lieut. R. H. CORBISHLEY, Devon R., attd. R.F.C.

Deaths

Capt. RICHARD CRAVEN GRANT, Scottish Rifles and R.A.F., who was reported missing on September 2, 1918, and is now officially presumed to have died on or since that date, was the youngest son of Capt. W. A. Grant, late 13th Hussars, Densworth Cottage, Chichester.

Flying Officer JOHN BARCLAY JAKES, M.C., R.A.F., formerly lieutenant in the 12th Durham L.I., who was killed in an aeroplane crash between Khartum and Cairo on April 1, 1919, was the son of Mr. and Mrs. T. W. Jakes, Hollinside Hall, Lanchester, Co. Durham.

Flight-Comdr. SYDNEY PHILIP SMITH, 26th Squadron, R.A.F., previously reported missing, now officially reported killed in action while leading an attack on a greatly superior formation under Richthofen, on April 6, 1918, at the age of 22, was the second son of Mr. and Mrs. Arthur Smith, Morningside, Aldershot.

Married

Capt. CLAUD CECIL BRILL, late R.A.F., second son of Arthur Brill, "Winscombe," Wallington, was married on March 30 at Holy Trinity Church, Sloane Square, W., to DOROTHY, only daughter of JAMES WEBB HUNT, "Paika," Sutton.

CHARLES DAVIDSON, M.C., R.A.F., was married on April 7 at St. Paul's, Knightsbridge, to DORIS, only child of Mr. and Mrs. George A. MORISON, of 8, Douro Place, W., Hayling Island, Hants, and Johannesburg, South Africa.

Maj. V. W. EYRE (late R.A.F.), son of the late Capt. V. T. Eyre, of Lindley Hall, Leicestershire, and of Mrs. Eyre, 40, Egerton Crescent, was married on April 6 at St. James', Spanish Place, to ESMÉ, younger daughter of the late Capt. CUTLAR-FERGUSON, of Craigdarroch, and the Scots Guards, and twin sister of Miss Cutlar-Fergusson, of Craigdarroch.

WILLIAM STOTHERT HILL-TOUT (late Capt., R.A.F.), second son of Mr. and Mrs. Charles Hill-Tout, of Abbotsford, British Columbia, was married on April 6 at All Saints' Cathedral,

Spokane, Washington, U.S.A., to KATHLEEN, youngest daughter of the late Dr. ALFRED SHEEN and of Mrs. Sheen, 21, Oakfield Street, Cardiff.

Capt. A. D. NEWBURY, R.A.F., eldest son of Mr. and Mrs. Alfred E. Newbury, of Ilford, Essex, was married on March 31, to DORIS MAY, only daughter of Mr. and Mrs. PERCY THOMPSON, of Overdale, Loughton, Essex.

Capt. J. O'DWYER, D.F.C., 1st Sherwood Foresters, only son of the late Surgeon-General O'Dwyer, was married on March 24 at St. Jude's, South Kensington, to OLGA, youngest daughter of Mrs. GOSWIN, Cleveland, Parkstone, Dorset.

To be Married

The engagement is announced between Capt. JOHN REGINALD BLUNT, late R.A.F., son of Mr. and Mrs. Reginald Blunt, of 12, Carlyle Mansions, Chelsea, and HELEN MARY, third daughter of Professor and Mrs. SPENSER WILKINSON, of 99, Oakley Street, Chelsea. The wedding will take place in September.

The engagement is announced between Capt. ROBIN GORDON MACK, R.A.F., only son of Mr. and Mrs. Mack, of Beresford House, Highbury New Park, and EVA MARGARET, elder daughter of Brig.-Gen. and Mrs. GORDON MONEY, of 32, Arlington Road, Eastbourne.

The engagement is announced between Capt. F. C. YOUNG, late R.A.F., of Bowdon, Cheshire, and ELSIE, younger daughter of Mr. and Mrs. OLLEVENSHAW, of Aldersyde, Hale, Cheshire.

Items

Maj. GRAEME ANDERSON reports that Maj. DRAPER, who recently met with a serious accident, is making excellent progress, and will be allowed up at the end of this week; no visitors, except relations, are allowed to see him. The fractured ankle is in splendid position, and it is hoped that a good result will be obtained.

Killed in France in 1918, Capt. JOHN GORDON SMITH CHEETHAM HILL SMITH GRANT, R.F.C., sole partner in the Glenlivet Distillery, left personal estate in the United Kingdom of £78,219.



A Deputation of Japanese officers, consisting of Lieut.-Gen. Nagaoka; Maj.-Gen. Itami, Military Attaché; Maj. Oyaizu, Technical Adviser to Military Attaché; and Capt. Sano, Interpreter to Embassy, at the Supermarine Aviation Works, Ltd., Southampton. After a complete inspection of the works, which interested them very much, they participated in flights over Southampton Water in one of the Supermarine four-seater flying-boats, after which they were landed at Hamble, where they were received by representatives of Messrs. A. V. Roe and Co., Ltd., who afterwards flew them to Bristol, where they were received by the Bristol Aeroplane Co., whence they returned to London.

THE ROYAL AIR FORCE

London Gazette, April 2

The following promotions are made with effect from March 1:—
Wing Commander to be Group Captain.—A. J. L. Scott, C.B., M.C. A.F.C., Squadron Leader to be Wing Commander.—R. J. Bone, D.S.O.
Flight Lieutenants to be Squadron Leaders.—D. S. K. Crosbie, O.B.E., S. C. W. Smith, D.S.O., G. B. Dacre, D.S.O., L. D. D. McKean, D. Stewart, M.C., A.F.C.
Flying and Observer Officers to be Flight-Lieutenants.—G. N. Humphreys, F. P. Adams, A. G. Weir, F. Paterson, C. G. Mathew, M. G. McL. Cahill-Byrne, W. R. S. Humphreys, A.F.C., W. A. Hancock, H. Dawes, M.B.E., A. B. Langridge.

London Gazette, April 7

The notification in the *Gazette* of October 24, 1919, appointing Flight-Lieut. W. E. Gardner, D.S.C. (A.) to a short service commn. is cancelled.

Flying Branch

Flight-Lieut. T. W. Elmhirst, A.F.C., to be Flight-Lieut. (A'ship), from (S.O.); April 1.

Second Lieutenants to be Lieutenants.—(Hon. Lieut.) F. Cave-Brown-Cave; Sept. 19, 1918. T. A. Chilcott; Feb. 12, 1919 (since demobilised). S. L. Horsman; March 26, 1919 (since demobilised). T. Hartford; July 5, 1919 (since demobilised).

Pilot Officer W. S. Cooper to be Flying Officer; Jan. 23.
P.F.O. N. H. Wallace (late R.N.A.S.) is granted a temp. commn. as Sec. Lieut. (A.); Sept. 16, 1918.

Sec. Lieut. A. R. H. Young relinquishes his commn. on ceasing to be employed; April 25, 1919.

(Then follow the names of 55 officers who are transfd. to the Unemployed List under various dates.)

Maj. A. K. Robertson relinquishes his commn. on account of ill-health, and is permitted to retain his rank; March 6.

Capt. C. N. Downs relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; March 26.

The following Lieuts. relinquish their commns. on account of ill-health caused by wounds, and are permitted to retain their rank:—H. C. W. Walters, D.F.C.; March 25. J. A. Loutit (Lieut., Camb. R., T.F.); March 30. Lieut. E. A. Clear, M.C., relinquishes his commn.; Sept. 10, 1919. The following Sec. Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—N. Farson; Feb. 9 (substituted for notification in *Gazettes* March 2 and March 12). B. Dixon; March 25. C. R. Baxter; March 26. Flight-Lieut. M. H. Spencer to take rank precedence as if his appointment as Flight-Lieut. bore date April 1, 1919.

The notifications in *Gazettes* Jan. 9 concerning Flight-Lieut. E. P. Roberts, M.C., D.C.M. (Lieut., Suss. R.); *Gazette* Oct. 28, 1919, Lieut. E. A. Clear, M.C.; *Gazette* March 23, Lieut. J. Martin (*Gazette* March 2 to stand); *Gazette* March 2, Sec. Lieut. B. Dixon; *Gazette* Oct. 19, 1919, Sec. Lieut. H. S. Crees (substituted for *Gazette* Feb. 10 re Lieut. H. S. Crees); *Gazette* May 16, 1919, Sec. Lieut. A. R. H. Young; *Gazette*, April 1, 1919, Sec. Lieut. H. Wittop (*Gazette* Sept. 9, 1919, to stand), are cancelled.

Administrative Branch

Wing Comdr. (actg. Air Commodore) F. G. Willock, C.B.E., D.S.O., relinquishes the actg. rank of Air Commodore, on ceasing to be employed as Air Commodore; Jan. 1. Sec. Lieut. W. R. Bowmer is graded for purposes of pay and allowances as Lieut. whilst employed as Lieut.; May 1, 1919, to May 23, 1919. Pilot Officer (Hon. Flying Officer) W. A. Berry to be Pilot Officer (Hon. Flying Officer), from (S.O.); March 15.

(Then follow the names of 10 officers who are transfd. to the Unemployed List under various dates.)

Lieut. W. E. Berwick, M.B.E., relinquishes his commn. on account of ill-health contracted on active service, and is granted the rank of Capt.; March 25. Sec. Lieut. C. W. N. Fuller relinquishes his commn. on account of ill-health, and is permitted to retain his rank; March 29.

Technical Branch

Sqdn. Ldr. F. C. Williams, O.B.E., to be Sqdn. Ldr., from (S.O.); March 25. Lieut. W. Briggs to be Lieut., Grade (A.), from (K.B.); Oct. 3, 1918. Pilot Officer R. McL. Freemantle, M.B.E., to be Flying Officer, Grade (A.); Oct. 1, 1919.

Sec. Lieuts. to be Lieuts. without pay and allowances of that rank:—E. F. Cameron; Feb. 21, 1918 (since demobilised). W. H. Preston, D.C.M.; May 4, 1919. Sec. Lieut. R. S. Davidson to be Sec. Lieut., Grade (A.), from (Ad.); March 10, 1919. Pilot Officer (Hon. Flight-Lieut.) R. Hodge to be Pilot Officer (Hon. Flight-Lieut.), from Unemployed List; March 15, with precedence next below Pilot Officer W. J. D. Partridge.

Sqdn. Ldr. G. E. Smith, O.B.E. (Capt., E. Yorks. R.), relinquishes his temp. R.A.F. commn. on return to Army duty; Nov. 26, 1919 (substituted for notification in the *Gazette* of March 19). Flg. Officer N. W. Wale (Lieut., I.A.R.O.), relinquishes his temp. R.A.F. commn. on reversion to I.A.R.O.; March 26.

Flight-Lieut. W. E. French (Eng. Lieut., R.N.) relinquishes his temp. R.A.F. commn. on return to Naval duty; April 1.

(Then follow the names of 27 officers who are transfd. to the Unemployed List under various dates.)

Capt. R. K. Paton relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; March 12. Lieut. A. M. R. Nicholson relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; March 2 (substituted for notifications in *Gazettes* of March 9 and March 30, wherein this officer's initials were shown as A. M. L.). Sec. Lieut. (Hon. Lieut.) R. G. Morrison (Lieut., 3rd Hrs.) relinquishes his R.A.F. commn., and is permitted to retain rank of Lieut.; March 5, 1919. The rank of Lieut. N. Pellew is as now described, and not as stated in *Gazette* of March 9.

The notifications in *Gazette* March 19 concerning Sec. Lieut. R. Simpson, and *Gazette* July 8, 1919, Sec. Lieut. W. F. Hendry (*Gazette* July 1, 1919, to stand), are cancelled.

Medical Branch

Wing Comdr. C. B. Head, C.B.E., relinquishes his temp. R.A.F. commn. on ceasing to be employed; April 1.

(Two officers transfd. to the Unemployed List.)

Memoranda

(Then follow the names of two overseas Cadets and 183 Canadian Cadets, also 59 Cadets granted hon. commns. as Sec. Lieuts.)

Flight-Lieut. O. H. Frost, M.B.E., M.C., is placed on the half-pay list; April 1. Obs. Officer the Hon. M. H. R. Knatchbull, M.C., is placed on the half-pay list; April 1. Sqdn. Ldr. V. A. Albrecht, O.B.E., M.C. (Capt., Manch. R.), relinquishes his temp. R.A.F. commn. on return to Army duty, March 29.

London Gazette, April 9

Permanent Commissions

Wing Comdr. L. A. Strange, D.S.O., M.C., D.F.C., is placed on half pay (Scale A) for six months commencing March 17.

(Then follow the names of 21 officers who are transfd. to the Unemployed List under various dates.)

Lieut. H. W. Smith relinquishes his commn. on account of ill-health caused by wounds, and is granted rank of Capt.; Oct. 7, 1919 (substituted for notification in *Gazette* of Oct. 14, 1919). Lieut. C. S. Bowen relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; March 30.

R.A.F. BOXING COMPETITION FINALS

THERE was a large and enthusiastic audience at the Uxbridge headquarters on Thursday last, when the final bouts for the trophies and medals presented to the R.A.F. for yearly competition by Col. Sir Charles C. Wakefield, Bart., took place. Among others present were Air-Marshal Sir Hugh Trenchard, Chief of Air Staff, Vice-Marshal Sir John Salmond, Commanding the Home Air Force; Air-Commodore Vyvyan, President of the R.A.F. Boxing Association, and many other leading officers.

The results were as follows:—

Officers

Light.—Flying Officer Poole (Cranwell). **Middle.**—Cadet Handcock (Cranwell). **Light Heavy.**—Cadet David (Cranwell). **Welters.**—Flying Officer Adams (Uxbridge). **Heavies.**—Cadet Drabble (Cranwell).

Team Trophy.—1: Cranwell, 14 pts. 2: No. 1 Group, Uxbridge, 11 pts.

Other Ranks

Flyweights.—Goodman (Barrow). **Bantam.**—Lewis (Baldonnell). **Feathers.**—Cottingham (I.A.A.D.). **Light.**—Abbott (I.A.A.D.). **Welters.**—Higgins (Cranwell). **Middles.**—Corley (Leuchars). **Light Heavy.**—Bishop (Bircham Newton). **Heavy.**—Fairbrass (Cranwell).

Team Trophy.—1: Henlow, 38½ pts. 2: Cranwell, 28 pts. **Special prize for best loser.**—A.C. 2 James (Uxbridge).

The boxing throughout was of the keenest description and of an unusually high standard for novices, who formed by far the larger part of the competitors, while the organisation of the whole affair reflected the greatest credit on all concerned. There was not the slightest hitch or delay from

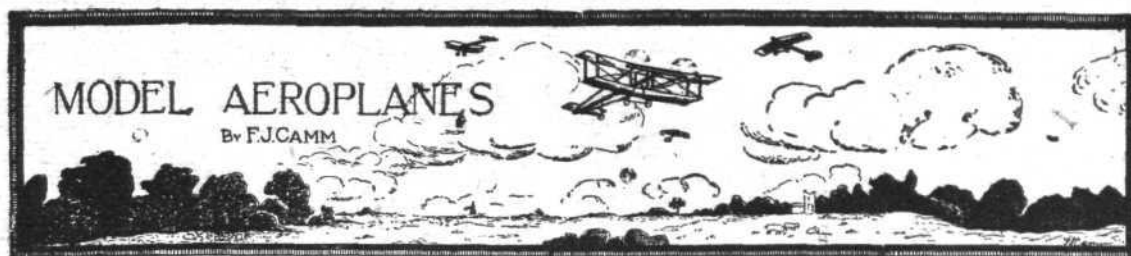
beginning to end, and it is seldom that any evening boxing has passed off with such complete smoothness.

The referee was Squadron-Leader J. E. Parkin, M.B.E., and the time-keepers were Air-Commodore the Rev. H. L. D. Viener, C.B.E., Chaplain-in-Chief, and Wing-Commander the Rev. J. R. Walkey, while special praise is due to Squadron-Leader E. G. H. Clarke, Squadron-Leader Bradley, and Flight-Lieutenant F. G. Sherriff for their share of the management.

At the conclusion of the contests Sir John Salmond said Sir Charles Wakefield had long taken a special interest in the Air Service, for it was he who came to the rescue of the Central Air Force Hospital at Hampstead during the war, and spent a very large amount on providing it with comforts. During the last few days Sir Charles had offered to the Air Council a number of scholarships for the cadet movement. He referred to the value of the great stimulus which had been given to the physical training of the R.A.F. by the action of Sir Charles in presenting these very handsome prizes.

Sir Charles Wakefield had a most enthusiastic reception. Having distributed the trophies and medals, he said he had immensely enjoyed the evening. In his younger days he had been a boxer himself, and therefore they would understand how much he had appreciated the very clean manner in which every contest had been carried out, and he felt amply repaid for anything he had been able to do to encourage the sporting spirit among them.

Sir Hugh Trenchard said he wished to thank Sir Charles Wakefield most heartily in the name of the whole Air Force for his magnificent trophies, and for his generous and practical interest in the Air Force. Long might it continue.



NOTE.—All communications should be addressed to the Model Editor.

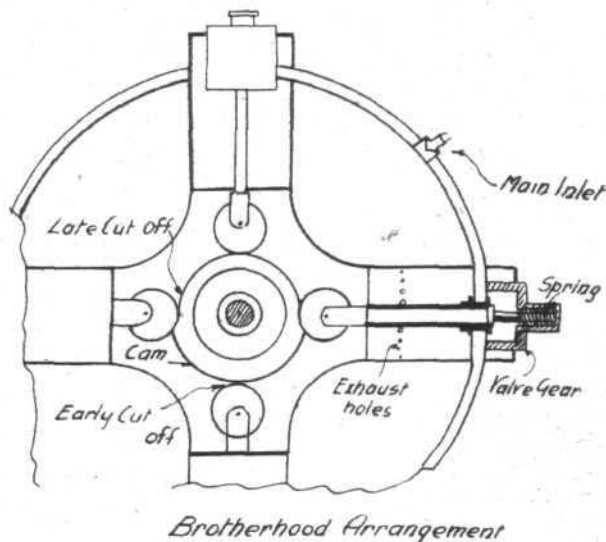
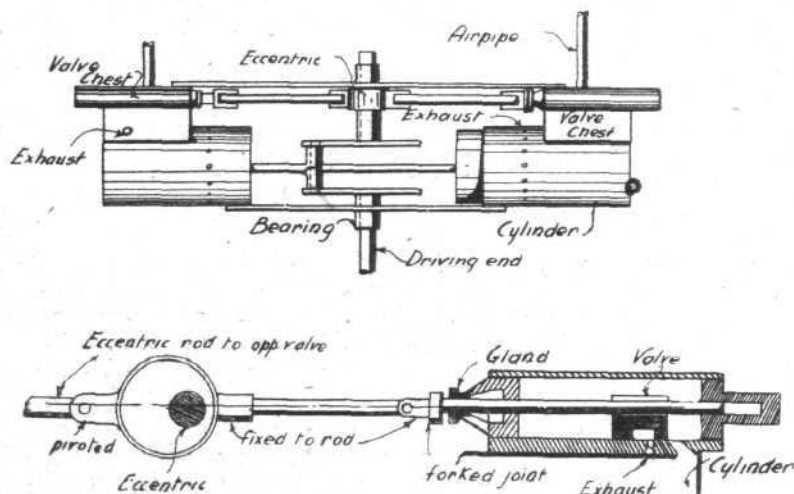
Compressed Air Engines

THE engine shown in the appended drawing is well within the realm of the amateur. On the left is a general arrangement, showing the oscillating valves. The latter are usually inefficient and wasteful of power, but easy to make and useful for machines up to 14 ozs. total weight; the engine should not weigh more than 1½ ozs. The web of the crank is extended to give mechanical balance, and a single eccentric may be made to operate the two valves. The eccentric strap should be rigidly fixed to one eccentric rod, while the opposite rod should be pivoted to the strap, as shown in the lower drawing, as well as to the fork on the valve-spindle. The cylinder and valve-chest may be built up from tube plate, rod-brass and German silver, every part being made as light as possible. The second drawing shows the Brotherhood arrangement for four-cylindred engines, consisting of disposing the cylinder in one plane at 90° to each other, and to make each trunk

a glossy surface. The proofing may, of course, be coloured before application, if it is desired to impart a colour to the silk, by adding suitable paint powder to it. The following colours are most suitable: For green, gamboge and prussian blue; red, crimson lake; brown, Vandyke brown or burnt sienna; purple, crimson lake and ultramarine; blue, french ultramarine; yellow, either gamboge or yellow lake; black, lamp black.

Simple Steam-Chest for Bending.

Many readers seem to find difficulty in bending model aircscrews, skids, etc. This is usually due, I find, to inefficient steaming apparatus. A simple steam-chest for bending purposes may be made in the following way: Take a piece of brass tube of sufficient length and diameter to accommodate the largest spars, etc., to be bent. Fix this to the spout of an ordinary teakettle, so that steam cannot escape between the joint; old kettles can effectively be employed. See that



piston work on to the one crank. A single rotating-valve may be used, with pipe connections, and the exhaust may be assisted by side ports in the cylinders. Or each cylinder can have a separate valve, as shown in the drawing, with poppet valves and a cam-lifting gear, the exhaust being entirely accomplished by side ports. Only one cam projection is required. Such an engine is light and perfectly balanced, and the torque is quite even. At least one cylinder would be in action at any point of the stroke.

Aluminium Soldering.

For those who wish to embody aluminium in their designs, but are unable to solder it, the following information will be useful. For an aluminium solder to be successful, it must contain a percentage of phosphor tin. A solder I can personally recommend is composed of tin, 75.5 parts; zinc, 25 parts; phosphor-tin, 1 part; and aluminium, 1.5 parts. Melt the aluminium first, add the zinc in small pieces, then the tin in small pieces, and, finally, the phosphor tin. Stearin is by far the best flux to use.

The temperature required to make a sweated joint with the above solder is about 700 deg. Fahr., and a blow-pipe is preferable to a soldering bit, as heat may be maintained. If, however, a bit is preferred, it should be aluminium or nickel instead of copper.

Proofing and Colouring Silk.

Japanese silk is by far the best material to use for covering, and is best bought ready proofed. If the model builder prefers to proof it himself I recommend him to stretch it on the planes first, and then give it an even coat of a mixture made of equal parts japan gold size and boiled linseed oil; this will dry with

the lid is steam-tight, and having filled the kettle, place it on the gas ring or fire and the wood to be bent into the tube. Steam thus for ten minutes or so. In finishing the woodwork after bending it should preferably be lacquered since it dries flatter and is less liable to run into corners and give a messy effect than varnish. Cold lacquer should be used, and the colourless variety gives a cleaner effect. This lacquer, which I believe is made by dissolving celluloid in amyl acetate, can be put on hard woods without previously sizing it. Screws dipped in boiling wax are seldom known to warp after bending.

Making Hollow Spars.

Hollow spars may easily be made, if a circular saw is available. Each one is planed up to its rectangular shape and size. The fence is then set from the saw blade a distance equal to the thickness of the flange of the channel. The table of the saw-bench is then tilted until only an amount of the saw projects equal to the depth of the channel. The prepared spar is now passed over the saw, taking care to keep it pressed against the fence. When both cuts have been made, the spar is laid upon the bench and the centre portion (between the saw-cuts) pared away with a chisel, the depth of the channel and, consequently, the thickness of the web being kept uniform throughout. A small saw such as can be run between centres, on a lathe is suitable for this sort of work. A table can easily be rigged up on the lathe bed out of some pieces of deal. Without the use of this saw it will be necessary to mark off from each edge with a pencil, lines to the depth of each flange, and working up to these lines to cut the wood away with a chisel. The lacquer previously referred to may be used for polishing.

SIDEWINDS

WEATHER conditions of the severest type have added to the strenuousness of the official tests through which the Handley Page commercial aeroplanes, which have been supplied to the Chinese Government, have been passing. The first machine successfully made its trial flight in a gale and the second aeroplane was recently frost-bound whilst flying with 20 passengers on the occasion of its first official test. The cold was so intense at 6,000 ft. that the oil froze on the struts and wires, and a thermometer carried by a Chinese official sitting in the nose of the machine registered a temperature of 20° below zero.

THE Handley Page flying-boats, which have been sent to Peru to inaugurate commercial flying services, were recently christened on the beach at Ancon by the breaking of champagne bottles over the bows. President Leguia of Peru then demonstrated his confidence in aviation by circling over the Pacific as the first passenger in one of the boats. On the completion of the flight he predicted a great future for aviation in Peru on account of the necessity for coastal communication in that country.

IN consequence of the extraordinary success of the pleasure flights carried out last summer at various popular resorts by Messrs. A. V. Roe and Co., Ltd., the directors have decided to enter upon a still more extended campaign during the coming season. It will be recalled that in four months of 1919 over 30,000 passengers were taken into the air on Avro aeroplanes and seaplanes, and not one of them met with a fatality. Obviously this record did a great deal to impress the public with the safety of flight and so to instil confidence in the future of aerial transport. Arrangements have been made for well-known pilots to open Avro stations at various places, and while a complete programme cannot be published, the following may be mentioned:—Capt. D. D. C. Hearn will be at Margate, where a new and very convenient aerodrome has been prepared. Messrs. G. S. Sparks and E. A. Bullock will be in charge at Swansea. Mr. Sparks was in charge of the Avro station there last year, and so has valuable local experience. Messrs. Cobham and Holmes, late of the Berkshire Aviation Co., will give Avro flights over a large area in the Midlands. Messrs. G. B. Moxon and H. A. Brown will run the station at Rhyl. Messrs. D. Shanks and Rogers will open flying at Blackpool when, and if, the Corporation grants the necessary permission.

Cross-country flights are to be arranged from any of the Avro stations.

It is gratifying to note that despite all the difficulties in the way of civil flying, Messrs. A. V. Roe and Co., Ltd., are resolved to persist in their campaign of practical propaganda.

THE Rotax Motor Accessories Co., Ltd., of Rotax works, Willesden Junction, N.W. 10, have acquired the control of Messrs. Newtons, Ltd., of Taunton. It is a very old-established firm of makers of dynamos for various purposes, their works covering three acres, including a large iron foundry. These added manufacturing resources should be beneficial to the many customers of the firm.



The stand of Messrs. S. Smith and Son at the New York Aero Show: Amongst the articles on exhibition were the Smith Aviation Instrument Board, Longitudinal Clinometer, Huson Compasses types 253, 517, 256, 254, Smith Kite Balloon Winch Indicator, Time of Trip Clock and various types of Revolution Indicator Gear Boxes.

COMPANY MATTERS

Aircraft Manufacturing Co., Ltd.

THE company states that the question of the payment of the dividend due April 1 on the first preference shares has been deferred pending the completion of the accounts for the year ended March 31, 1920.

NEW COMPANY REGISTERED

BERMUDA AND WEST ATLANTIC AVIATION CO., LTD., 166, Piccadilly, W.—Capital £50,000, in £1 shares. Objects, to establish aerodromes and air stations in Bermuda and elsewhere, and air services between Bermuda, North, South and Central America, the Bahamas and West Indies; acquiring the benefit of the negotiations and work already conducted and carried on in Bermuda by A. V. Roe and Co., Ltd., with a view to obtaining concessions and other assets of the said company in Bermuda; under an agreement with the said company, the Beardmore Aero Engine, Ltd., the British Maritime Trust, Ltd., the Supermarine Aviation Works, Ltd., H. H. Kitchener and H. Hemming. First directors: F. E. Priest, M.I.C.E. (representing A. V. Roe and Co., Ltd.); J. Bird (representing Supermarine Aviation Works, Ltd.); F. M. Luther (representing the Beardmore Aero Engine, Ltd.); H. Hemming, The British Maritime Trust, Ltd., have the right to appoint a director.



AERONAUTICAL PATENTS PUBLISHED

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m. = motors.

APPLIED FOR IN 1916

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published April 8, 1920.

6,744. F. C. JENKINS. Aircraft. (139,825.)

Published April 15, 1920

13,213. SOC. ANON. ASTRA and H. KAPFERER. Servo-motor apparatus. (140,107.)

APPLIED FOR IN 1917

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published April 8, 1920.

16,655. C. SAGUI and P. CASSINELLI. Clinometers or spirit levels. (139,828.)

Published April 15, 1920

17,804. SOC. DES MOTEURS SALMSON. Control for aeroplanes. (140,110.)

APPLIED FOR IN 1919

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published April 8, 1920.

2,189. J. E. MARDEN. Means for stopping way of aircraft. (139,854.)

8,483. R. MACKAY. Framing for rigid airships. (139,909.)

9,315. W. C. GARDINER. Magnetic compasses. (139,920.)

16,245. F. H. PAGE. Power unit for aircraft. (139,984.)

16,461. A. V. ROE. Landing-devices for aircraft. (130,340.)

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